

IAQ Coordinator's Guide: A Guide to Implementing an IAQ Program

Indoor Air Quality



Tools For Schools



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Note: Separate pieces in this Kit include:

- IAQ Reference Guide;
- IAQ Road Map;
- IAQ Backgrounder;
- IAQ Checklists;
- Fact Sheet on District-wide Implementation;
- Awards Program;
- Managing Asthma in the School Environment;
- Two Videos; and
- IAQ Problem Solving Wheel.

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DISCLAIMER

Any information gathered using this Kit is for the benefit and use of schools and school districts. EPA does not require retention or submission of any information gathered, and EPA has no regulatory or enforcement authority regarding general indoor air quality in schools. This Kit has been reviewed in accordance with EPA's policies. Information provides the current scientific and technical understanding of the issues presented. Following the advice given will not necessarily provide complete protection in all situations or against all health hazards that may be caused by indoor air pollution.

Mention of any trade names or commercial products does not constitute endorsement or recommendation for use.

WARNING

Please note the following as you prepare to use this Kit:

- This Kit is not intended as a substitute for appropriate emergency action in a hazardous situation that may be immediately threatening to life or safety.
- Modification of building functions, equipment, or structure to remedy air quality complaints may create other indoor air quality problems and may impact life-safety systems and energy use. A thorough understanding of all the factors that interact to create indoor air quality problems can help avoid this undesirable outcome. Consult with professionals as necessary.
- In the event that medical records are used while evaluating an IAQ problem, maintain confidentiality.

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www.epa.gov/iaq.

Section 1 – IAQ Tools for Schools Program and Kit Overview



The U.S. Environmental Protection Agency (EPA) created the *Indoor Air Quality Tools for Schools (IAQ TFS)* Program to help schools assess and improve indoor air quality (IAQ). IAQ is becoming an increasingly important issue in our nation's schools. Approximately 20 percent of the U.S. population—nearly 56 million people—spend their days inside elementary and secondary schools. Good IAQ assists schools with their core mission—educating children. The background information and activities in this voluntary program are directed toward existing schools in the kindergarten through twelfth grade range, but colleges, universities, preschool, and day-care centers could benefit by applying the principles and activities presented. In addition, architects and engineers could apply many of these principles when planning new schools or major renovations. For additional information on designing healthy learning environments for the next generation, visit EPA's *Indoor Air Quality Design Tools for Schools (IAQ DTFS)* Web site at www.epa.gov/iaq/schooldesign.

The *IAQ TFS* Program, which can be implemented at a school or district level, provides a variety of resources including this *IAQ TFS* Kit, an Awards Program, the annual *IAQ TFS* National Symposium, and a variety of publications and brochures on the program and various IAQ-related topics. The annual *IAQ TFS* National Symposium brings together school board officials, administrators, school nurses, teachers, facility managers, school and health association members, parents, and others to learn how to develop and implement good IAQ practices in schools. As part of the Awards Program, EPA holds a ceremony at the Symposium to provide national recognition to schools and districts committed to improving IAQ and implementing an IAQ Management Plan.

This Kit provides clear and easily-applied guidance that will help schools develop and implement an IAQ Management Plan, identify and resolve existing IAQ issues,

and prevent future IAQ problems. For questions on indoor air quality, schools should call the IAQ Information Clearinghouse at (800) 438-4318. A number of resources and publications, available on EPA's Web site at www.epa.gov/iaq, provide additional guidance and information for schools interested in improving their IAQ.

IMPLEMENTING THE IAQ TFS PROGRAM

Individual schools and school districts can implement an *IAQ TFS* Program. Although many of the steps are similar, there are a few notable differences.

Individual Schools. To develop and implement an *IAQ TFS* Program, individual schools should take the following 11 steps:

- 1) Familiarize yourself with IAQ issues and the IAQ program. Review the *IAQ TFS* Kit and watch the *Taking Action & Ventilation Basics Video* and the *IAQ Walkthrough Video*.
- 2) Commit to and gain support for your program from school officials. Apply for a Great Start Award.
- 3) Select an IAQ Coordinator to oversee your school's IAQ program.
- 4) Form an IAQ Team with representatives from various groups within the school.
- 5) Gather information on IAQ in the school through research.
- 6) Distribute and complete the *IAQ TFS* checklists.
- 7) Review the *IAQ TFS* checklists and list identified problems.
- 8) Complete a walkthrough inspection of the school.
- 9) Identify, prioritize, and resolve problems, focusing first on health and safety and low-cost solutions.
- 10) Establish appropriate IAQ policies and develop an IAQ Management

Plan for your school (see **Section 3** of this Guide for a model plan).

- 11) Follow-up with inspections and assess your problem-solving performance. Develop a schedule for IAQ events and file all IAQ information. Also, communicate success of your IAQ efforts, apply for a Leadership or Excellence Award, and serve as a mentor for other schools.

School Districts. Districts interested in implementing an *IAQ TjS* Program need to follow the same general steps as individual schools, with the following variations:

- When the district selects an IAQ Coordinator to function at the district level, it is important to designate IAQ contacts for each school within the district. (Larger districts with numerous schools may prefer to have regional contacts.)
- The district IAQ Coordinator should meet regularly with the school or regional contacts to keep everyone up to date on the progress of the IAQ program.
- The IAQ Team is also at the district level and should represent a wide variety of backgrounds, including at least one individual with the authority to make district-wide decisions. In addition, individual schools can form IAQ teams.
- When assessing school buildings throughout the district, the IAQ Team will prioritize schools, completing walkthroughs at schools with more pressing IAQ problems first.
- The Team should ensure that IAQ policies and improvements are implemented consistently throughout the district and should also communicate the importance and successes of the district's IAQ efforts.

Districts can successfully implement the Kit in many ways. Case studies of

successful programs are available on EPA's Web site (www.epa.gov/iaq/schools). Districts, like individual schools, are eligible to receive EPA's Great Start, Leadership, and Excellence Awards.

Importance of an IAQ Management Plan

A well-designed IAQ Management Plan yields substantial benefits for schools, employees, and students. Using this plan can also reduce or avoid the expensive process of investigating and mitigating suspected IAQ problems.

A typical school contains a variety of special use areas (such as kitchens, locker rooms, science laboratories, technology education rooms, darkrooms, art rooms, cleaning storage areas, and grounds maintenance storage areas), each with pollutant sources that can cause discomfort and health problems. Under detailed inspection, most schools will reveal some inadequacies of design, construction, operation, and maintenance.

Significant IAQ problems often arise from a combination of common minor problems, rather than from unique circumstances. For example:

- A school is not getting enough outdoor air because a fan belt is broken or slipping *and* a seldom used drain trap dries out, resulting in sewer gases being drawn into the school.
- The design of the school ceiling/roof allows significant air leakage through unintentional openings *and* stack effect (warm air rising) pushes indoor air out through these openings, causing radon to be drawn into the school through cracks and utility penetrations in the floor.
- A housekeeping product is mixed at twice the recommended strength so it "does a better job" *and* the unused mix is placed in an inappropriate container *and* stored in a utility closet that is connected to the return air

ductwork, which carries pollutants to other parts of the school.

IAQ problems may occur even in schools where a conscientious effort is being made to avoid such problems. Schools that can demonstrate ongoing efforts to provide a safe indoor environment, however, are in a strong legal and ethical position if problems do arise. Further considerations for instituting an IAQ Management Plan include:

- Quick, cost-effective response if problems occur.
- Peace of mind for parents, students, and staff.
- Occupant comfort, efficiency, and durability of the physical plant and equipment.
- Reduced need for crisis intervention involving upper-level management.

THE IAQ TFS KIT

This Kit (see diagram on page 4) consists of a Road Map, two guides, various checklists, a problem-solving wheel, background information on IAQ, a fact sheet on district-wide implementation, a summary of the Awards Program, videos, and a companion piece on managing asthma in schools.

This Guide, the **IAQ Coordinator's Guide: A Guide to Implementing an IAQ Program**, provides in-depth guidance for schools and districts just beginning their IAQ programs. This Guide describes how to launch, develop, and implement a comprehensive IAQ program and highlights tips for schools and school districts. The IAQ Coordinator may find the simple steps presented in the Road Map helpful for implementing an IAQ program. The **IAQ Reference Guide** contains useful background information on the importance of IAQ as well as guidance on diagnosing and solving IAQ problems, effective communication, and several important IAQ topics (including

radon, asthma, mold, and secondhand smoke). In addition, there is a list of useful resources included in **Appendix L** of the **IAQ Reference Guide**, including resources available through states, regions, non-profit organizations, associations, unions, as well as a list of publications for various IAQ topics.

The various checklists, accompanied by the *IAQ Backgrounder*, should be distributed to and completed by various school staff. Schools will find the problem-solving wheel, videos, asthma companion piece, and fact sheet helpful in solving IAQ problems and learning more about the IAQ program and its benefits. (Although not included in this Kit, other valuable resources include the **IAQ TFS Communications Guide** and **IAQ Design Tools for Schools (DTfS)**, available on EPA's Web site at www.epa.gov/iaq.)

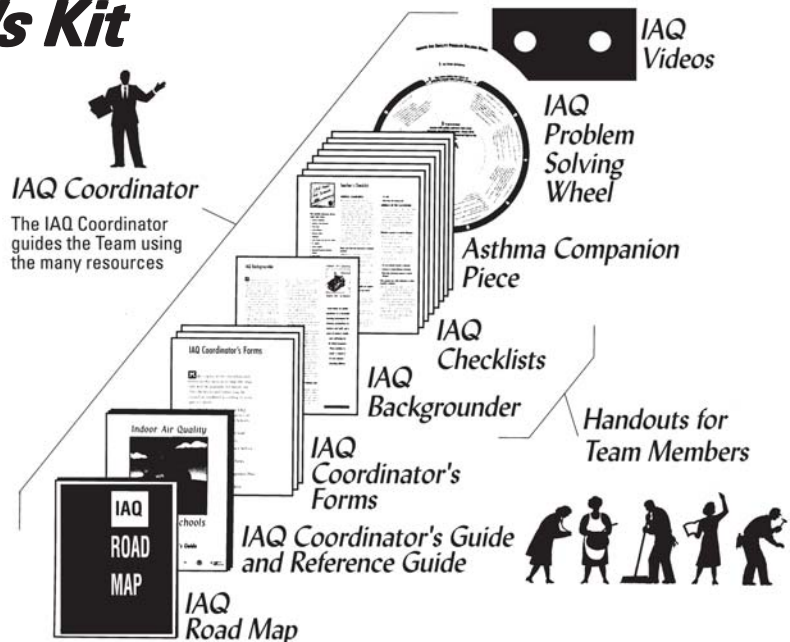
Why Follow This Guidance?

There are many important reasons to implement this guidance:

- **Save Money**—The expense and effort to prevent most IAQ problems are typically much less than the expense and effort to resolve problems after they develop.
- **Utilize in-house staff**—Schools can prevent many IAQ problems by educating staff and students about the factors that create them. When IAQ problems do arise, they can often be resolved using skills available in-house.
- **Work effectively with contractors or professionals**—If you need outside assistance to solve an IAQ problem, being an informed customer will achieve the best results.
- **Improve IAQ**—Some of the suggested practices and policies will not only help prevent problems but will also result in improved air quality in and around the school.

Refer to the **IAQ Reference Guide**, included in the Kit, for more information on the benefits of maintaining good IAQ.

IAQ Tools for Schools Kit



IAQ Checklists



IAQ TEAM WALKTHROUGH

Look, smell, feel and listen for existing or potential IAQ problems as you tour your school facilities.



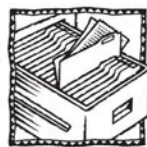
TEACHERS

Improve comfort, health, and performance for you and your students by preventing IAQ problems in the classroom.



SCHOOL OFFICIALS

Provide support, promote communication, and gain recognition for the school's IAQ program.



ADMINISTRATIVE STAFF

Promote cleanliness and maintain good IAQ in offices and rooms with printing and duplicating equipment.



HEALTH OFFICERS

Recognize and monitor trends in reported illnesses that may give early warning of IAQ problems.



FOOD SERVICE STAFF

Reduce odors, moisture, and food waste, thereby lowering the risk of short- or long-term health problems linked to poor IAQ.

FACILITIES AND MAINTENANCE STAFF



VENTILATION

Be sure the ventilation system is clean and that an adequate amount of outside air is supplied to the school.



BUILDING & GROUNDS MAINTENANCE

Review supplies and follow label instructions; select the safest, most effective products; handle and dispose of supplies safely.



WASTE MANAGEMENT

Use proper waste disposal practices to control odors, contaminants, and pests.



RENOVATION AND REPAIRS

During repairs, minimize dust, fumes, and off-gassing from building materials. Avoid designs that interfere with ventilation.



INTEGRATED PEST MANAGEMENT

Use a comprehensive approach to manage and prevent pest problems with minimal use of pesticides.

Section 2 – Develop an IAQ TfS Program



An effective IAQ program can help schools and districts address IAQ issues quickly and efficiently and create a healthier learning environment for staff and students. The program should be tailored to the specific needs of your

school or school district, as the organizational and physical structures of schools vary. Although the administrative process of “who” and “when” is flexible, it is important that the major individual activities be completed.

Start-Up Hints

In addition to completing the coordinator’s forms provided in Appendix A:

- Obtain a map/blueprint of the school. This will be an invaluable resource as you implement your IAQ program.
- Make a copy of any existing school policies and building specifications/codes, such as anti-idling policies or rules about where the school buses must park for student drop-off/pick-up.
- Count the number of staff and their job categories (for example, the number of teachers and the number of maintenance staff). You’ll need this information to distribute checklists.
- Gather names and contact information for any of the school’s outside contractors, such as maintenance staff; heating, ventilation, and air-conditioning contractors; or bus fleet operators.
- Secure support from the school and/or school district administration.
- Read the *IAQ Coordinator’s Guide*, especially this section: “Develop an IAQ TfS Program.”
- Meet with your school’s heating, ventilation, and air-conditioning technician to acquire a working knowledge of the various ventilation units at your school. Learn which systems serve which rooms.
- Meet with the custodial staff to form a better understanding of their tasks, maintenance schedules, equipment inventory, and resources (budgets).
- Meet with school bus fleet administrators/operators to learn about the buses in the fleet (e.g., model year, mileage, safety features, replacement schedules).
- Set up a location for turning in checklists and a filing system for all the paperwork you will generate. Keep it in a convenient location. (Portable file boxes work nicely.)
- Set up an IAQ Resource Center at your school in an area where staff members can access information at their leisure. This is also a great place to post important reminders and communicate with staff.

By following the 11 steps presented below, schools and districts can implement a successful *IAQ TFS* Program.

1. FAMILIARIZE YOURSELF WITH IAQ ISSUES AND THE IAQ TFS PROGRAM

It is essential for schools and districts to recognize good IAQ as a top priority and commit to improving IAQ and ensuring a safe and healthy learning environment for students and staff.

Review the IAQ TFS Kit. The first step for schools interested in launching an IAQ program is to review the contents of the *IAQ TFS* Kit. The Kit will help you understand basic IAQ issues in schools, how the program works, and how everyone can play a role.

Watch the Videos. The Taking Action & Ventilation Basics video included in the Kit provides information on why IAQ is important, the IAQ TFS Program, how to begin a program, and how school ventilation systems (which are integral to IAQ issues) operate. The IAQ Walkthrough Video (included in the Kit) illustrates some of the most common IAQ problems found in schools, and is ideal for schools that are beginning to implement an IAQ program.

Find a Mentor. Obtain firsthand knowledge from other schools and districts experienced with the *IAQ TFS* Program. They may be able to help you design and implement a program that meets your school's specific needs. EPA formed the *IAQ TFS* Mentor Network to provide a collaborative network for IAQ advocates to share their experiences and successes and to offer advice to schools involved or interested in the *IAQ TFS* Program. Visit EPA's Web site to learn more about how to join the Mentor Network (www.epa.gov/iaq/schools/).

Apply for a Great Start Award. Once your school or school district decides to address IAQ issues through the *IAQ TFS* Program, inform EPA of your commitment

in a letter. This notification will qualify the school or district for EPA's Great Start Award, which can help you gain support for your IAQ program from administrators, school staff, and community members. Great Start Award recipients are given a certificate, a welcome letter, and information about how to access other *IAQ TFS* resources. Refer to the *Awards Program* tab of the Kit for more information.

After reviewing the Kit and videos, you should be ready to kick off your IAQ program. This Guide, along with the sample memos and checklists included in **Appendix A**, provide you with the organizational tools necessary to implement a successful IAQ program. Gaining support or "buy in" from school officials and committees, choosing an IAQ Coordinator, and assembling an IAQ Team are key components of this program.

***DISTRICTS:** *It is important to develop active IAQ management programs for all district schools. Make Kits available to each school and encourage everyone to become familiar with the IAQ TFS resources. Begin to organize how the district will handle and respond to IAQ problems.*

2. COMMIT TO AND GAIN SUPPORT FOR YOUR IAQ PROGRAM

Schools often need the support of superintendents, school boards, facility management directors, and business or financial officers to implement an effective IAQ program. In fact, obtaining buy-in from highest levels of school district administration is often essential to secure the funds necessary to the long-term success of an IAQ program. The top levels of administration have the authority to ensure that the school staff have the proper incentive and resources to carry out an IAQ program.

Most *IAQ TFS* activities have specifically been designed to have minimal impact on the school budget and time resources of

school staff. Some of the actions associated with implementing this guidance, however, may need to be coordinated with specific school committees (such as health and safety committee) or groups (such as unions or the local PTA). It may be useful to provide a briefing to these committees and groups as well as to the highest levels of school or district administration using information from this Kit (e.g., the *IAQ Backgrounder*, **Sections 1 and 3** of the *IAQ Reference Guide*).

All school personnel can potentially be affected by IAQ and will be better advocates of the school's IAQ program if they understand the health effects associated with poor IAQ. Therefore, it is advisable to conduct a training session for all school employees to familiarize them with the *IAQ TjS* Kit and their role in improving IAQ.

Remember that implementing an IAQ management program is an on-going process, not an overnight miracle. Be patient, consistent, organized, and never forget that you are doing something important for staff and students at your school.

***DISTRICTS:** Identify interested principals and building managers in individual schools who would be willing to initiate and/or lead IAQ improvements. Conduct training sessions for all IAQ contacts as well as school faculty and staff to familiarize them with the *IAQ TjS* Kit. Districts may find it easier to incorporate these training sessions into scheduled general staff or district meetings.

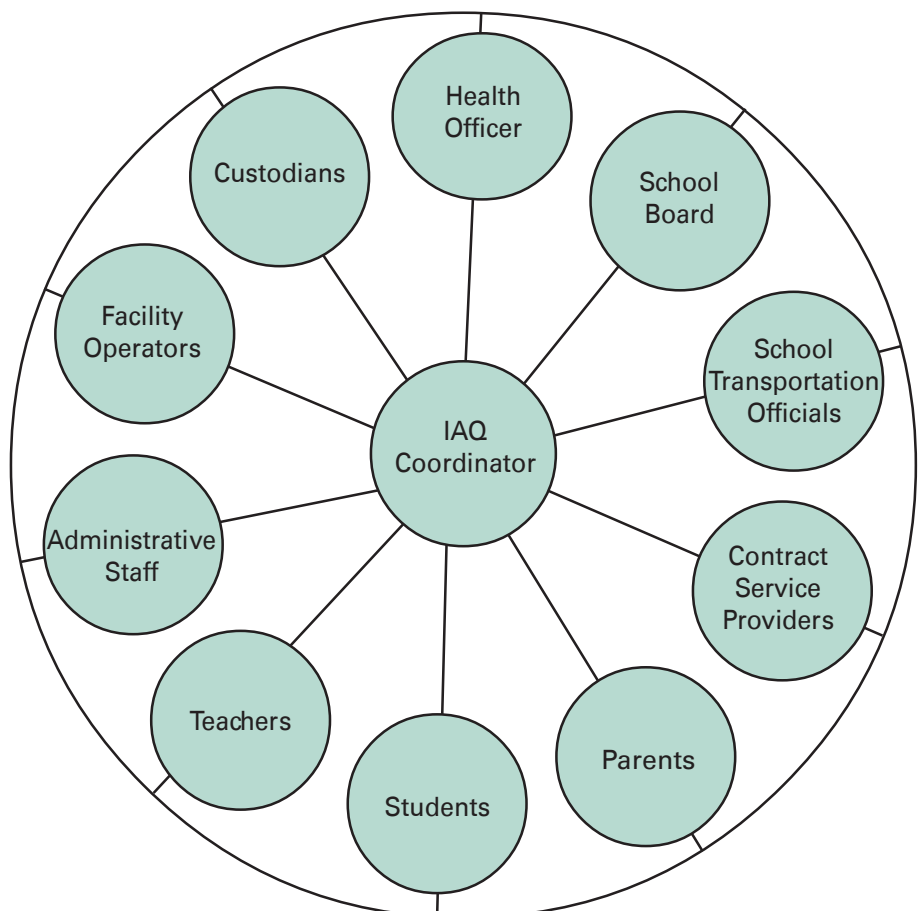
3. SELECT AN IAQ COORDINATOR

The primary role of the IAQ Coordinator is team management and leadership. Leading people is an important function of the IAQ Coordinator because people both affect and are affected by the quality of indoor air. IAQ Team members and the rest of the school staff can share most of

the day-to-day work. For example, others can assist with copying and distributing the *IAQ Backgrounder* and IAQ checklists and summarizing checklist responses. Delegation of activities to the IAQ Team members helps ensure that people in the school understand their role. Because no one person is overly burdened, the program is more likely to take off and succeed.

The primary IAQ Coordinator functions include:

Team Leadership: Coordinates an "IAQ Team," as shown in the figure below, and encourages a sense of shared responsibility and cooperative effort. Provides the Team with information and educational opportunities and, in coordination with the IAQ Team, implements the IAQ Management Plan



(Section 3).

Emergency Response: Ensures that the school is prepared for emergency response, as outlined in the IAQ Management Plan. Follows the guidance and makes decisions as outlined in “Resolving IAQ Problems” (Sections 4-6 of the *IAQ Reference Guide*). Determines if and when outside professional assistance is needed and coordinates activities.

Key Authority: Disseminates IAQ information, registers IAQ complaints and directs responses, and communicates IAQ issues and status to school administration, staff, students, parents, and the press. The IAQ Coordinator should, therefore, be familiar with the importance of good IAQ and the IAQ issues facing the school (Sections 1-2 of the *IAQ Reference Guide*).

The selection of an IAQ Coordinator depends on the organizational structure of your school system. Often, the IAQ Coordinator is a principal, school nurse, teacher, facility manager, or another staff member. Since most school staff have busy schedules, providing an incentive (such as a stipend) may help schools recruit the most qualified person.

The ability to carry out necessary functions, level of leadership, and genuine interest in improving the indoor environment in the school(s) should drive the choice of the IAQ Coordinator. In any event, success depends on selecting someone who can manage the Team and who is empowered to take action. This includes authority to interact with district-level administration, school staff, students, and parents, and to make budget recommendations. The IAQ Coordinator does not have to be an “expert” in IAQ issues. By using the information in this Kit, the IAQ Coordinator and all team members will learn about IAQ as the work progresses. The *IAQ Reference Guide* and the *IAQ Coordinator’s Guide*, in particular, will help the IAQ

Coordinator become familiar with IAQ issues in schools and provide a basic understanding of the IAQ management plan process and effective communication.

Some schools and districts share the responsibilities of the IAQ Coordinator by having a co-coordinator or by delegating many of the administrative tasks to an IAQ Team or an existing health and safety committee. Independent of who is acting as the team leader, it is fundamentally important that staff and students have the opportunity to learn about the basics of indoor air quality (*IAQ Background*) so that their daily decisions and activities (IAQ checklists) will prevent and not cause indoor air problems.

***DISTRICTS:** *The IAQ Coordinator in school districts may be a district-level administrative person, such as the business official, a health and safety officer, or the facilities manager. The IAQ Coordinator should designate IAQ contacts at each school in the district (or regional contacts) to enable the district’s IAQ Team to have an on-site manager for IAQ concerns at each school (or region). The contacts may choose to create IAQ Teams in their respective schools to support their IAQ efforts.*

4. FORM AN IAQ TEAM

In most schools using this Kit, a committed team works with the IAQ Coordinator to implement the *IAQ TFS* Program. This team, which is led by the IAQ Coordinator, can (and probably should) include representatives from nine distinct groups:

Teachers and Principals play a strong role because they have daily interaction with students, access to parents, and knowledge of classroom issues. These staff members are the eyes and the ears of the school and, therefore, are invaluable for identifying and monitoring IAQ issues.

Administrative and Support Staff have knowledge about unique pollutant sources, such as printing areas, and any

ventilation problems in areas with pollutant sources.

Facility Operators have knowledge about ventilation systems and their requirements. Their specific expertise is essential to develop a good IAQ plan and to prevent and resolve IAQ problems.

Custodians see the day-to-day condition of the school. Their involvement with the IAQ Team is crucial, as they play such an important role in maintaining the school's buildings and grounds.

Health Officers/School Nurses know the status of student health. Their knowledge of specific health problems and their ability to track health problems and use of medication allows them to monitor and recognize trends in reported illnesses. These trends may provide an early warning of IAQ problems. In addition, they can educate students and staff about asthma triggers and provide validation that IAQ can affect the health of students and staff.

School Board Representatives can help obtain the authority and funding necessary to support IAQ efforts.

School Transportation Officials can ensure that anti-idling policies are enforced and that school bus fleets meet current pollution control standards.

Contract Service Providers have specific areas of expertise that can help schools complete necessary activities without degrading IAQ. Examples of these activities include pesticide application, bus fleet management and operation, renovation work (such as roofing), and maintenance of ventilation equipment and air filters.

Students are exposed to and spend time in many areas of the school on a daily basis. They can help identify problems in the school that affect their health and safety and research solutions. In one school, for example, students researched the impact of various floor coverings on

IAQ and raised funds to purchase high-performance carpet and linoleum for their classroom.

Parents have various areas of expertise and skills that can help improve the learning environment of their children and promote the school's IAQ efforts.

The Team can also include individuals from the community, such as local environmental or health department staff; volunteers from local businesses who have special skills, such as commercial building engineers; or organizations that have a strong interest in securing proper IAQ in the school system (refer to the **IAQ Reference Guide, Section L: "Resources"**).

Each team member may want to read the **IAQ Coordinator's Guide** and the **IAQ Reference Guide** for more detailed information on IAQ and on the process of using this Kit to prevent, identify, and resolve IAQ problems in the school.

****DISTRICTS:** Ensure that members of the IAQ Team adequately represent the entire district. Ideally, individuals who are part of this Team should be key players in the implementation of the IAQ TfS Program. IAQ Team members should include at least one individual with the authority to make district-wide decisions.*

5. GATHER INFORMATION ON IAQ AND THE SCHOOL

Researching the school's history with important IAQ topics in mind, including asbestos, radon, integrated pest management (IPM), lead, and mobile sources of pollutants, will help to focus your IAQ efforts. After establishing the history, the next step involves assessing the current status of these issues in the school.

Developing and implementing standard procedures to gather and track information will ensure consistency in the data, and keeping the information organized in a

central, stable location (such as in the building manager's office) will make it easier to locate data in the future. There are many methods available to schools for gathering information about IAQ in your buildings. For example, schools should consider impacts on IAQ from any recent changes to the school building or areas near the building (for example, construction of highways or other buildings), the school schedule or activities, or to occupants. Sample considerations include:

- Has flooding occurred? Look and smell for mold growth and an increase in IAQ complaints in flooded areas.
- Are there night or weekend classes? Check time clock settings on the ventilation system(s) for areas where these classes are held.
- Have new staff been added? Update them on your IAQ program and activities.
- Has enrollment increased or decreased?
- Have ventilation systems been modified? Did this result in proper fresh air intake?

Asbestos. Asbestos is a naturally occurring mineral fiber commonly used in building construction materials for insulation and as a fire-retardant. If undamaged and unlikely to be disturbed, asbestos should be left alone. Disturbing asbestos materials through building renovations or asbestos removal can release asbestos fibers into the air, potentially leading to inhalation and accumulation within the lungs. Over time, a buildup of asbestos fibers embedded within the lung tissue may lead to serious lung diseases including asbestosis (irreversible lung scarring that can be fatal), lung cancer, and mesothelioma (a cancer of the chest and abdominal linings). Under the 1986 Asbestos Hazard Emergency Response Act (AHERA), all public primary and secondary schools are

required to re-inspect their buildings for asbestos-containing building materials every 3 years. Inspections must be conducted by EPA-certified asbestos inspectors. For more information on AHERA or asbestos, visit EPA's Web site at www.epa.gov/iaq/asbestos/ or see **Appendix L: "Resources" in the *IAQ Reference Guide*.**

Consider the following questions regarding your asbestos status:

- Is there a blueprint available that clearly identifies the location of asbestos-containing materials within the school?
- Has a responsible party been designated by the school district to perform and delegate, if necessary, the management of asbestos in the school building?
- Is a copy of the school's asbestos management plan kept in the school's administrative office?

Radon. Radon is a colorless, odorless, and tasteless radioactive gas that occurs naturally in almost all soil and rock. Radon can enter schools through cracks or other openings in their foundations. Radon is second only to smoking as the main cause of lung cancer in America. EPA provides free guidance on how to perform testing and recommends that all schools test for the presence of radon. For information on how to test for radon and how to reduce radon within your school, see **Appendices G and L in the *IAQ Reference Guide*** and visit EPA's radon Web site at www.epa.gov/radon.

Consider the following questions regarding your current radon status:

- Has testing for radon been completed?
- If needed, has a radon mitigation system been installed?
- Are all radon mitigation systems operating properly?

Integrated Pest Management (IPM).

Several of the activities in the checklists affect the number of pests in your school by restricting the availability of food and water. EPA recommends that schools use IPM, an effective and environmentally sensitive approach to pest management that uses a combination of common-sense practices. IPM can reduce the use of chemicals and provide economical and effective pest suppression. For details on IPM, see **Appendix K: “Integrated Pest Management”** in the *IAQ Reference Guide*, and *Pest Control in the School Environment: Adopting Integrated Pest Management* (EPA 735-F-93-012). Contact the National Pesticide Telecommunication Network Hotline (1-800-858-7378), or visit schoolipm.ifas.ufl.edu/ for more information.

Consider the following questions regarding your current pest control program:

- Are IPM principles being applied in all areas of your school or district?
- Are staff using pest control chemicals in accordance with instructions?
- Are spot-treatments of pesticides used to control obviously infested areas instead of widespread, indiscriminate applications?

Lead. Lead causes various problems, particularly for children and pregnant women. Contact with lead-containing dust particles is a potential concern during renovation or repair of surfaces with lead-based paint. Lead poisoning can affect children’s developing nervous systems, causing learning disabilities and reduced IQ. Guidelines for proper removal of lead are available from the Occupational Safety and Health Administration (OSHA) (see **Appendix L: “Resources”** in the *IAQ Reference Guide*).

Consider the following questions regarding your school’s current lead status:

- Has lead contamination been assessed

in your school?

- Is a lead control or removal program in place?
- Will any upcoming renovation work affect surfaces painted with lead-based paint?

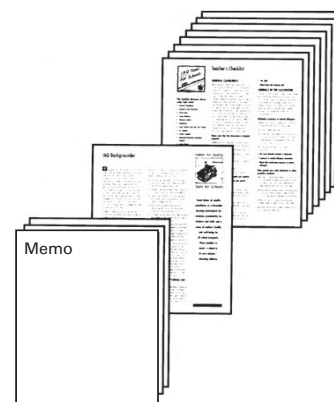
Lab Chemicals and Other Toxics.

Mercury. Mercury is found in products such as fluorescent light bulbs, thermostats, thermometers, barometers, batteries, and electrical switches and relays. Mercury can permanently damage the brain and kidneys, especially in developing fetuses. Exposure can occur through inhalation of vapors, skin contact (if mercury is accidentally spilled or leaked), or while using chemicals containing mercury. There are now non-mercury or low-mercury product substitutes. If a mercury spill or leak occurs, contact your local health department immediately.

Consider the following questions regarding your school’s current mercury status:

- Does your school have an emergency plan in case of a mercury spill?
- Will you conduct a mercury identification and removal effort?
- Have you checked your chemical storage areas and science rooms to remove unnecessary bulk mercury or mercury containing chemicals? Are those areas secure?

PCBs. PCBs were widely used as coolants and lubricants in such devices as transformers, capacitors, and ballasts (a component of fluorescent light fixtures) until PCBs were banned in 1978. PCBs may cause cancer and immunological, reproductive, neurological, liver, and kidney damage. Exposures in schools are most likely to come from leaky fluorescent lighting fixtures installed prior to 1980. PCBs and associated wastes are regulated under the Toxics Substance and Control



Checklist Packets

Act as well as various state laws.

Consider the following questions regarding your school's current PCB status:

- Were your fluorescent light fixtures installed prior to 1980?
- Are there any signs of leaks around the fluorescent light fixtures?

Chemicals. A high diversity of hazardous chemicals (toxic, reactive, corrosive, and explosive) can be found in science classrooms, labs, art classrooms, and storage rooms, as well as used in building and grounds maintenance (e.g., cleaning and pest control). Many are often outdated or unknown, posing a particularly dangerous situation in the event of a fire. Schools may inadvertently purchase chemicals in excessive amounts, store them incorrectly, and dispose of them improperly. Exposure to these chemicals can occur during normal use and when they spill or leak.

Consider the following questions regarding your school's current chemical status:

- Has your school conducted a chemical inventory and clean-out recently?
- Does your school have a chemical management plan in place?

Motor Vehicles and Equipment.

Mobile sources, such as buses, cars, and lawnmowers, emit air pollutants that penetrate indoors through air intakes and open windows. Mobile source pollution is also a potential problem outdoors on school grounds and for children traveling on school buses. Several studies suggest that exposure to vehicle emissions—especially diesel exhaust—can aggravate asthma and cause other serious respiratory problems. Idling of buses during pick-up and drop-off is particularly problematic. Detailed information about reducing mobile source emissions in and around schools is presented in **Appendix I: “Mobile Sources”** in the *IAQ Reference*

Guide.

Consider all aspects of transportation on your school grounds, including:

- How many buses are in your school's bus fleet? How old are the buses? What is the replacement schedule for old buses?
- How many people drive to school? Is there a public bus stop or commuter train nearby?
- Do buses or other vehicles (e.g., delivery trucks) idle near the school? Is there a policy in place and enforced that prohibits buses and cars from idling near doors, windows, and air intakes?

6. DISTRIBUTE IAQ CHECKLISTS

This Kit provides various checklists to help the IAQ Team develop a profile of the school's current IAQ (including known or potential indoor and outdoor sources), prevent potential IAQ problems, and resolve problems as they arise.

The IAQ Team may wish to introduce the checklist packets during a meeting with school faculty and staff. The Team should copy and distribute the following information to the appropriate staff members:

IAQ Backgrounder. This backgrounder will provide all IAQ Team and staff members with a summary of important issues regarding IAQ. It includes a definition of IAQ, why IAQ is important, basic problems and control methods, the team approach, and strategies for communication. Graphics are included to clarify ventilation issues in classrooms.

IAQ Checklists. The checklists provide detailed, yet simple, IAQ activities for each type of space in the school. These activities are based on the unique functions and locations of teachers, administrative staff, school officials, facility operators, custodians, health

officers, school nurses, and contract service providers. Each activity deals with a specific pollutant source or ventilation issue. A *Checklist Log*, located in **Appendix A**, is provided to assist in summarizing the data from the completed checklists. All checklists can be revised to address the specific needs of your school or district.

School Memo (optional). For school staff, the memo or letter carries the school administration's request that staff members perform the activities as specified in their individual information packets. For the school board, contract service providers, students and parents, the memo introduces the IAQ Backgrounder and notifies recipients that the school has undertaken an IAQ management program. Several sample memos that can be adapted to your school's needs are included in **Appendix A**: "IAQ Coordinator's Forms."

Information packets for parents and local media may contain the memo and IAQ Backgrounder.

Checklist Interval. To help maintain good IAQ, it is important to establish a checklist interval. The *IAQ Coordinator's Checklist* should be completed twice each year, starting with the beginning of the school year. Midway through the school year, such as during winter break, is an appropriate time for the second checkup.

7. REVIEW THE CHECKLISTS

The information provided by the checklists is essential to the success of the IAQ program and can help schools focus their efforts during their walkthrough. While all the checklists provide useful information on IAQ in schools, the checklists that are essential for building an effective IAQ management plan include: walkthrough, ventilation, teachers, and building and grounds maintenance.

The IAQ Coordinator should record all completed checklists on the *Checklist Log*

and review all information. Make a list of irregularities for review during the walkthrough inspection. A blueprint/layout of the school may be useful for tracking the location of health problems and determining where pollutant sources exist. Some schools share the results of the checklists by presenting them at school PTA meetings or by placing them on the school's Intranet or Web site.

***DISTRICTS:** *The checklist results will help districts prioritize schools for walkthroughs. Address schools with more pressing IAQ problems first.*

8. COMPLETE THE WALKTHROUGH

Completing the *Walkthrough Checklist* is an essential component for identifying IAQ problems in a school. Watch the *IAQ Walkthrough Video* included in the Kit before conducting an inspection. The video demonstrates how to conduct a walkthrough and complete the *Walkthrough Checklist*.

The walkthrough is not intended to be an intensive and detailed inspection, but rather a quick overview of the conditions that affect the quality of air within the school. It is valuable for the entire IAQ Team to participate in the walkthrough. At a minimum, have someone who is familiar with the operation of the building, such as a facility operator or custodian, accompany you during the inspection. During your walkthrough, you can learn a lot about a school's IAQ status by using your senses:

- **Observe** the general level of cleanliness in classrooms and mechanical rooms. Look for pollutant sources such as mold, improperly stored chemicals, dirty air filters or ducts, and blocked airflow pathways (e.g., books or papers on top of unit ventilators or plywood covering outdoor air intakes). Determine whether vehicles idle for long periods and whether the idling is in close proximity to the building's air

Use the
Walkthrough Checklist
provided with this Kit to
guide you during the
walkthrough.

You can learn a lot by
using your senses of
sight, smell, touch, and
hearing to gather
information on factors
that affect IAQ.

intakes or to students and staff.

- *Smell* for unique or objectionable odors as you move from room to room.
- *Feel* for uncomfortable air temperatures, drafts, high or low humidity, and air flowing into and out of grilles and air vents.
- *Listen* to the concerns of school occupants regarding IAQ. Do they provide clues to problems (such as using their own pest spray to control pests, or turning off the unit ventilator because it is too noisy during class-time)? Do you hear unusual equipment noises that may indicate potential problems? Do you hear air blowing out

PREVENTION SAVES

If minor problems are allowed to develop into a serious IAQ problem, a variety of deficiencies may be identified, but the one that caused the problem often cannot be easily determined. As a result, schools can be confronted with an expensive list of potential explanations of their problem. The crisis atmosphere surrounding a serious IAQ problem creates pressure to remedy every deficiency immediately instead of establishing a prioritized approach to IAQ improvement. By contrast, many of the preventive measures recommended in this guidance can be accomplished with in-house effort, following a schedule that is consistent with your resources.

of supply vents?

Extend your walkthrough inspection to all special-use areas including the cafeteria, art rooms, industrial arts areas, science laboratories, and maintenance equipment storage areas. Where possible, resolve IAQ issues as you go, particularly low-cost and no-cost changes.

***DISTRICTS:** A district IAQ Team member should lead a walkthrough in

each school building with the school's IAQ contact or Team, principal, maintenance staff, a health official, or others directly involved in IAQ efforts. Districts may choose to have the same individuals or groups conduct the walkthroughs in all of their schools. Forward the findings to the district IAQ Team for review.

9. IDENTIFY, PRIORITIZE, AND RESOLVE PROBLEMS

In all likelihood, the checklists and your walkthrough inspection will reveal some IAQ problems. The **Problem Solving Wheel**, provided in the Kit, can help schools identify potential sources of IAQ problems based on health symptoms.

Sections 5 and 6 in the *IAQ Reference Guide* also provide assistance with diagnosing and solving IAQ problems. In addition, **Section 6** provides basic criteria for determining the practicality of proposed solutions.

Once identified, prioritize projects for each school into short-term and long-term categories, considering health-related and financial issues. Implement solutions that impact health or safety first. Then focus on problems that can be resolved by low-cost and/or in-house measures. Many IAQ hazards may be remediated by simply educating school staff and changing the current habits of school occupants (e.g., explaining to teachers that placing books on unit-ventilators or posters on air-return grilles prevents fresh air from circulating).

Make a "to-do" list and include any unresolved problems from previous checklists. This list can be incorporated into the school's plan for implementing long-term IAQ improvements. Because of the potential complexities involved in setting priorities for repairs and upgrades and for committing school resources, an agreement from top school management and appropriate committees will probably be necessary. As repairs and upgrades are

completed, ensure that you are still meeting your priorities.

Investigating Financing Options.

Sometimes repairs that require funding may be necessary. Various finance vehicles are available for funding the longer term, more expensive IAQ improvements (e.g., roofs, HVAC improvements). Many options are available to schools and states (e.g., low-interest loans, bonds, grants, performance contracts). Initiate a meeting with the Chief Financial Officer and business officials for the district. These individuals are essential to understanding the funding options available for schools. EPA offers finance training for school personnel and finance officers. For more information, visit EPA's Web site at www.epa.gov/iaq.

****DISTRICTS:*** *Prioritize IAQ improvements and repairs within your school district. School-wide problems that impact health or safety should be corrected first. Create a district IAQ budget and investigate additional financing options for larger projects.*

10. ESTABLISH IAQ POLICIES & MANAGEMENT PLAN

Once problems have been identified and resolved, it is important to develop IAQ policies and a comprehensive, proactive management plan. The plan will help to prevent IAQ problems and prepare the school to deal with any new IAQ issues that arise.

IAQ Management Plan. Develop an ongoing, active IAQ Management Plan supported by district-wide decision makers. The IAQ Management Plan should prioritize activities and identify areas needing special funding or attention. Emergency response and IAQ school policies, discussed below, should also be incorporated into the Plan. See **Section 3** of this Guide for a model IAQ Management Plan and use the checklist

provided in **Appendix A** to guide and log the development of the Plan.

IAQ Policies. Based on the problems uncovered as a result of the checklists and walkthrough, schools may want to develop various school policies regarding:

- Integrated pest management.
- Animals in the classroom.
- Food in the classroom.
- Location of idling motor vehicles (for example, buses and delivery trucks).
- Painting (for example, use low volatile organic compound paints and paint only when the building is unoccupied).
- Carpet (installation and/or cleaning).
- Cleaning procedures and products.

Proactive IAQ policies can prevent IAQ problems from developing and recurring. Ensure that all existing IAQ policies are being properly followed and are updated as necessary. **Appendix B:** “Developing Indoor Air Policies” provides more detailed information on establishing IAQ policies.

Emergency Response Plan. Acute IAQ problems—such as a chemical spill, unintentional shutdown of ventilation systems, or a flooded carpet—require an immediate response. Preparing for such events in advance will help ensure timely and cost-effective actions. Preparations may include developing a cooperative agreement or contract with a health and safety agency or private contractor to assist with acute IAQ problems that are beyond the capabilities of your IAQ Team. (See **Appendix A:** “Hiring Professional Assistance” in the **IAQ Reference Guide**.) Proper preparation can also mean having the appropriate equipment on hand. For example, stocking the equipment needed

Develop and maintain a schedule of events, such as building renovation, major repairs, summer shutdown, and new staff, that may affect IAQ.

to immediately clean and dry wet carpets or having a pre-established agreement with a professional cleaning firm that can provide immediate service on a 24-hour, 7-day-a-week basis.

***DISTRICTS:** *Implement a district-wide IAQ Management Plan, IAQ policies, and emergency response plans. Ensure that all schools in the district are aware and familiar with the policies and plans.*

11. ASSESS RESULTS AND COMMUNICATE SUCCESS

Follow-up. One of the final steps in implementing an IAQ TFS Program includes conducting follow-up inspections. Determine whether the repairs and upgrades were performed according to plan or specifications, whether the intended results were obtained, and whether areas are being properly maintained. Refer to **Section 6:** “Solving IAQ Problems” in the *IAQ Reference Guide* for help evaluating your solutions. Schools should also ensure that newly implemented policies, if any, are being followed.

To assess recent problem-solving performance, determine if changes need to be made in your ability to:

- Respond to IAQ complaints and incidents quickly.
- Resolve IAQ problems.
- Communicate in a way that prevents or reduces the concerns of school occupants and others during an IAQ problem or crisis.

For information on resolving IAQ complaints, incidents, and how to communicate when IAQ problems occur, use the guidance in **Sections 3-6** of the *IAQ Reference Guide*.

Develop a Schedule of IAQ Events. Develop and maintain a schedule of events that may affect IAQ:

- Establish a specific date for the next round of implementing the *IAQ Coordinator’s Checklist*, based on the previously determined interval.
- Check weekly for mold growth if your school is in a humid climate and will be unoccupied over the summer. Take preventive measures (such as cycling the cooling system to keep relative humidity below 60 percent) as needed.
- Mark your schedule in advance for renovations or new construction to allow enough lead time for you to provide information packets or other materials to the people performing the work and to the occupants of the affected areas.
- Provide appropriate checklists to new school staff so that they can become part of the IAQ program.
- Conduct ongoing classes about IAQ or incorporate IAQ trainings into general staff meetings. Make sure that staff understand how behavior can influence IAQ in a school building. Address any overall IAQ TFS implementation concerns that school staff and faculty may have.

File Checklists, Reports, and Notes.

For future reference and for accountability purposes, all completed paperwork should be filed in a readily accessible manner in a centralized location. Files should include:

- Completed checklists.
 - *IAQ Management Plan Checklist.*
 - *IAQ Coordinator’s Checklist.*
 - Checklists from IAQ Team members who received an information packet.
 - *Checklist Log.*
 - *IAQ Problem-Solving Checklist.*
- Copies of memos, status reports, and final reports.
- Copies of communications with school

or district administration.

- A copy of the school's floor plan.
- Personal notes, contracts, or other paperwork as appropriate.
- Up-to-date contact information.

***DISTRICTS:** *The IAQ Coordinator should have an opportunity to address and explain all improvements in each school through memos, meetings, or on the school Web site. District-wide refresher classes on IAQ TFS implementation are a great way to keep participants informed about the progress of the program and can help address any concerns of school faculty and staff.*

Communicate Success. It is important to keep school occupants and constituents informed about the repairs and the general status of IAQ in your school. Periodic reports containing updates on the status of the school's IAQ issues and a copy of the IAQ Management Plan should be sent to school staff, local unions, and administrators. Additional guidance on what to include in the report, as well as principles for effective communication, are presented in **Section 3: "Effective Communication"** of the **IAQ Reference Guide** and in EPA's **IAQ TFS Communications Guide** (EPA 402-K-02-008), available from IAQ INFO at 800-438-4318 and EPA's Web site.

When reporting to the school or district administration, it may be desirable to provide indicators of how successful the IAQ program has been to date. Indicators may include:

- All IAQ checklists completed and returned.
- All IAQ problems identified by the checklists corrected.
- Decreased absenteeism.

- Fewer IAQ complaints, visits to the nurse's office, and use of medications.
- Establishment of good relations with the local media.
- School memo and *IAQ Backgrounder* mailed to all parents.

Apply for IAQ TFS Awards. EPA's IAQ TFS Awards Program provides national recognition for exemplary IAQ programs in schools and districts. This recognition can provide the positive publicity necessary to ensure the long-term success of an IAQ program.

Schools and districts that have shown substantial progress implementing the *IAQ TFS* Kit are eligible for the **Leadership Award**. Award recipients receive a plaque and a press kit and are recognized on EPA's Web site. Refer to the *Awards Program* tab of the Kit for more information.

When a district IAQ Team has made significant progress on *IAQ TFS* and has demonstrated leadership in handling IAQ issues, it is eligible to apply for the **Excellence Award**. Excellence Award recipients are recognized during an awards ceremony in Washington, DC, and in a national press release, are featured on EPA's Web site, and receive a press kit. Refer to the *Awards Program* tab of the Kit for more information.

Serve as a Mentor. Share your experience and IAQ knowledge by mentoring other schools and districts. Visit EPA's Web site to learn more about how to join the Mentor Network.

It is important that everyone affected—students, parents, teachers, staff, unions, and administration—receive a report summarizing the status of IAQ issues.

Section 3 – Model IAQ Management Plan

Developing a comprehensive and effective IAQ Management Plan can help schools organize and implement their IAQ program. This chapter provides an example of a model IAQ Management Plan, based on several plans currently in use by schools and school districts. While all the sections below are useful and important, each school and/or school district should tailor the plan to meet their needs. Not every section will be necessary for every school or district. Consider including the following components in a comprehensive IAQ Management Plan:

1. Mission statement
2. Background and IAQ findings
3. IAQ policies and plans
4. Procedures
5. Role of the IAQ Coordinator and IAQ Team
6. Staff responsibilities for maintaining good IAQ
7. Applicable local and state requirements/regulations
8. Emergency response
9. Steps for prevention

Schools across the nation have used EPA's *IAQ T/S* resources to develop and implement successful IAQ programs. By implementing EPA's *IAQ T/S* Program and following the IAQ Management Plan in your school or district, you can help ensure a safe and healthy environment for students and staff.



IAQ Management Plan

[School District's Name]

Date

1. MISSION STATEMENT

The health, comfort, and learning environment of students and staff are important aspects of [school district's name's] mission. Working with EPA and their IAQ T/S Program, we developed an IAQ Management Plan that will help monitor and improve the quality of air in school buildings. The objectives of this IAQ Management Plan are:

- Reduce the levels of indoor air pollutants through preventive measures such as routine maintenance activities, periodic building evaluations and inspections, and IAQ-specific policies.
- Provide and maintain adequate airflow by repairing and maintaining ventilation equipment, which will promote a comfortable and healthy learning and working environment.
- Respond to IAQ-related concerns and problems in a prompt and thorough manner, and effectively communicate the progress of investigations and their resolution to all interested parties.

2. ROLE OF THE IAQ COORDINATOR AND IAQ TEAM

IAQ Coordinator

[School district's name] has identified [name of person] as the IAQ Coordinator for the district. The school administration and school board is committed to providing the necessary support to meet the school district's IAQ Management Plan objectives.

The IAQ Coordinator's responsibilities include:

- Acting as the key contact person within the district to respond to and address IAQ issues and concerns.
- Coordinating the development and management of the district's IAQ Management Plan. This includes establishing and overseeing an IAQ Team, coordinating building walkthrough inspections, coordinating the building system evaluations, coordinating the investigations of reported IAQ issues and concerns, and modifying the IAQ Management Plan to fit the district's specific needs and objectives.
- Responding to IAQ concerns and issues that are discussed or reported.
- Coordinating the IAQ Team's activities and meetings, including distribution of the IAQ checklists.
- Communicating with staff, parents, and other parties regarding the progress made with the Plan and the process of reporting IAQ concerns.
- Coordinating the annual review of the Plan, which involves building walkthrough inspections, building systems evaluations, and revising the Plan to include new information.
- Obtaining school board approval of the IAQ Management Plan after every major revision.

IAQ Team

[School district's name] has established an IAQ Team to represent [staff, students, and parents]. The IAQ Team assists the school district administration by reviewing IAQ-related information and recommending IAQ policies to maintain and improve the air quality within district facilities and school buildings.

Led by the IAQ Coordinator, the IAQ Team is involved in the following efforts.

- Supporting the IAQ Coordinator to ensure good IAQ in all facilities and areas.
- Contributing to the IAQ Management Plan creation and implementation. The members distribute the IAQ checklists and the *IAQ Backgrounder* to the appropriate staff members.
- Meeting regularly [monthly, quarterly, biannually, or another time-frame] to review and resolve IAQ issues.
- Meeting [annually or as needed, indicate frequency] to review the IAQ Management Plan, which includes the completion of walkthrough inspections of school buildings, key building systems evaluations, and the review of existing policies in the IAQ Management Plan.
- Meeting to evaluate and respond to IAQ concerns that have been reported to the district. The Team takes steps or recommends measures to resolve the reported concern.
- Maintaining IAQ Team meeting minutes, reports, and other documents in the IAQ Management Plan.

The following individuals are members of the IAQ Team:

| <u>Name</u> | <u>Position</u> | <u>Contact Information</u> | <u>Specific Duties</u> |
|-------------|--------------------|----------------------------|--|
| Joe Doe | Teacher | Room 10A | Coordinate checklist distribution and |
| Jane Doe | Facilities Manager | 123-4567 | Conduct facility walkthroughs that ventilation operating |
| Donna Doe | School Nurse | Health Office, | Track health symptoms a school |

3. BACKGROUND AND IAQ FINDINGS

Indoor air quality (IAQ) is a critical component of providing a healthy and comfortable learning environment. Indoor air pollutants may cause or contribute to short- and long-term health problems including asthma, respiratory tract infection and disease, allergic reactions, headaches, nasal congestion, eye and skin irritations, coughing, sneezing, fatigue, dizziness, and nausea. In addition, indoor air pollutants and extremes in temperature and humidity may cause discomfort, which can affect students' ability to concentrate and learn.

IAQ problems can hasten building deterioration, contribute to the closing of schools, create liability problems, and strain relationships among parents, teachers, school staff, unions, and the school administration.

[IAQ Team, IAQ Coordinator, or consultant's name] researches IAQ issues affecting the school. For example, schools' histories related to radon, pests, lead, and other IAQ issues are investigated and documented.

During the walkthrough inspections and building systems evaluations, [IAQ Team, IAQ Coordinator, or consultant's name] identifies IAQ and problems and issues. The issues are prioritized from most important to least important. Urgent or simple issues are addressed first and issues that require continual attention are scheduled appropriately.

Problems are reported to the IAQ Coordinator, who documents all IAQ concerns, performs an initial investigation, and documents and communicates the resolution to all interested parties. Many issues are resolved using in-house staff. However, professionals, experts, and other outside personnel may be brought in to deal with specific issues. The district administration expects to complete the necessary maintenance, renovations, and construction by [date].

The IAQ Coordinator [or Team] uses [a variety of tools, such as the Problem Solving Wheel, Problem Solving Checklist, and Sections 4-6 of the **IAQ Reference Guide**] to help identify IAQ problems. If the problem cannot be identified or persists despite the district's efforts to identify and remediate it, the IAQ Coordinator discusses the matter with the appropriate school official(s) in order to determine whether a contracted service provider is needed.

When a problem has been identified, the IAQ Coordinator coordinates a response, communicates with the relevant parties, documents actions taken, and keeps copies of all documents. When the problem is not urgent but requires a policy change, the IAQ Coordinator organizes a meeting with the [IAQ Team or a committee] to develop and recommend specific policy changes. These policy changes are presented to the appropriate school officials for review and adoption. All new or revised policies are added to the existing IAQ Management Plan. All interested parties are informed about the measures taken to resolve the problem and all policy changes.

4. IAQ POLICIES AND PLANS

[See Appendix B for more detailed information on developing IAQ policies.]

Animals in the Classroom Policy

While many teachers and students have classroom pets, animals can be a source of allergens, asthma triggers, and microorganisms that may cause infectious diseases. Therefore, [school district's name] has instituted an animal policy based on information gathered from walkthrough inspections, building systems evaluations, IAQ concern reports, and staff meetings.

Animals should be isolated to the extent possible and should be kept away from carpets, upholstered furniture, and stuffed toys. Specific types of animals may be restricted from the classroom if a concern is expressed by staff, students, or parents. The district also reserves the right to ban certain animals if they pose a threat to the safety or comfort of staff and students. Classroom pets should be placed away from return air ducts and from students with known allergy or asthma problems.

Food in the Classroom Policy

Food should not be left in classrooms. When it is necessary to store food in classrooms, it must be kept in airtight, sealed containers to minimize the potential for pests, odors, and biological growth.

Painting Policy

Schools must use latex, water-based paints; using paints that contain mercury or lead is prohibited. Painting and drying should only occur when the area of the building is unoccupied and properly ventilated. It is also important to inform all affected staff and students before a painting job begins. The school district's Hazardous Materials Policy is located in [location].

Hazardous Materials Policy

It is important to handle hazardous materials according to the manufacturers' guidelines. Wastes generated from hazardous materials should be stored separately from regular waste and disposed in appropriate containers. Hazardous materials are common in art, science, and vocational/industrial classes. Training sessions for staff can help explain the risks associated with hazardous materials and the importance of complying with this policy. The school district's Hazardous Materials Policy is located in [location].

Asbestos Hazard Emergency Response Act (AHERA) Management Plan

An AHERA Management Plan is required by Federal law and is intended to prevent staff exposure to asbestos during general operation and maintenance activities. It describes the location and condition of asbestos-containing building materials, and documents their removal and repairs. The AHERA Management Plan also describes the proper recordkeeping practices that school officials must follow. Schools must update their AHERA Management Plans with information collected from their periodic surveillance every 6 months, re-inspection of buildings for asbestos-containing materials every 3 years, and response actions taken within the school. The AHERA Management Plan is located in [location].

Integrated Pest Management Program

Integrated Pest Management (IPM) is a comprehensive strategy for controlling pests, pest-generated substances (such as cockroach fecal matter), and pesticides, which can act as irritants and trigger allergies and asthma. The district's IPM program aims to reduce the frequency and magnitude of both pesticide use and pest problems. The school district's IPM file is located in [location].

Lead Policy

Lead can adversely affect the nervous system. Young children are particularly susceptible. If lead is present in existing school building paint coatings, renovation procedures must be employed that minimize the exposure of building occupants to airborne lead-based paint particles. In addition, a "Lead in Water Plan" has been implemented that includes water sampling, faucet replacement, education, and record keeping. The Lead in Water Plan is located in [location].

Radon Gas Policy

Radon is a naturally-occurring gas that can enter into school buildings from the underlying soils, and build-up to levels that increase occupants' risk for developing lung cancer. Radon testing and mitigation has been performed in [locations]. Radon levels were found to be at [level in picocuries per liter (pCi/L)]. All radon levels that exceeded [level, usually 4 pCi/L] have been reduced to levels comparable to the outside air. Information on radon testing and mitigation is located in [location].

Non-Smoking Policy

[Law or school district's name] prohibits tobacco use in all public school facilities and vehicles. Information about smoking regulations is located in [location].

Anti-Idling Policy

Delivery and bus pickup and drop off zones have been located away from building outdoor air intakes to ensure that exhaust fumes do not enter the facility. [School district's name] prohibits buses and cars from idling while waiting to pick up or drop off students. Buses shall idle no longer than the time required to bring engines to proper operating temperature and to defrost all windows. This policy is not in effect when temperatures fall below 32 degrees Fahrenheit. The school district's anti-idling policy is located in [location].

5. PROCEDURES

Cleaning and Chemicals

Regular and thorough cleaning is an important means for the removal of air pollutant sources. However, the use of cleaning products may also contribute to indoor air pollution. To ensure that cleaning practices remove pollutant sources while using cleaning products appropriately, guidelines have been created.

- Custodial staff shall only use cleaning agents approved by the district for school use. All products must be clearly labeled and stored in a secure area. Bottles of cleaning agents must be tightly closed when stored.
- All material safety data sheets should be stored in an area available to all staff, and the location of this information is discussed in the district's "Employee Right to Know" annual training.
- Rooms must be kept clean. Slightly damp cloths are used to remove dust from surfaces—however, wiped surfaces should not be left damp or wet for extended periods of time, since this can cause mold growth.
- Ammonia-based cleaning agents and chlorine-containing cleaners (such as bleach) must never be mixed because this generates toxic gases.
- During routine operations, pollutant-releasing activities are restricted by time of day, week, or year. For example, the waxing of floors will be performed [on Friday afternoons or vacations, to ensure that gases are removed by the time classes resume].

- Areas of frequent use should be cleaned more often than areas of infrequent use.
- Large walk-off mats must be used to trap dirt and moisture at building entrances. These mats are cleaned according to manufacturers' guidelines to ensure optimal performance. Trapping dirt and moisture at building entrances helps to maintain the cleanliness of floors and carpets throughout the building.
- Staff are not permitted to bring any cleaning products, pesticides, air fresheners, or other chemicals into the school.

Flooring

The two most common types of floor covering for general use in schools are carpet and resilient floor covering products. Carpet offers acoustical and comfort benefits that are generally not available with other floor coverings. Many schools prefer to use carpet in classrooms and administrative areas. Resilient flooring is used for high traffic areas including classrooms, hallways, cafeterias, art rooms, restrooms, and anywhere liquid spills are likely.

While there is considerable debate about the most appropriate flooring material for use in schools, EPA recognizes that there are advantages and disadvantages associated with all types of floors coverings. Regardless of the floor covering type, regular and effective cleaning and maintenance is essential to keep it dry and clean. All carpets must be cleaned with hot water extraction at least twice a year. Carpet may not be cleaned during summer months unless it can be dried within 24 hours.

Preventive Maintenance and Operations

Preventive maintenance involves routine inspection, adjustment, and repair of building structures and systems, including the heating, ventilating, and air conditioning system (HVAC); unit ventilators; local exhaust; fresh air intakes; and flooring. Preventive maintenance plays a major role in maintaining the quality of air by assuring that the building systems are operating effectively and efficiently. Moreover, it helps to maintain comfortable temperatures and humidity in occupied spaces.

The preventive maintenance schedule for [school district's name] can be found in [location]. The schedule describes the time intervals and locations of building and ventilation components that are inspected and maintained on a routine basis. The schedule was established using the past experience of school district maintenance professionals, the availability of financial resources, and technical guides, including the manufacturer's specifications. All records of preventive maintenance are kept attached to the relevant operating system for easy evaluation.

Unless otherwise notes, school buildings should be maintained according to the American Society of Heating, Refrigerating, and Air-Conditioning Engineers' (ASHRAE) recommended comfort parameters. If the recommended parameters cannot be met, the district staff makes ventilation adjustments that provide fresh air, temperature, and humidity levels that are as close to the ASHRAE parameters as possible.

Construction and Renovation

[School district's name] should consider IAQ when planning construction and renovation projects. The IAQ Coordinator, [IAQ Team], superintendent, and school board discuss major structural changes that may impact IAQ. The findings from walkthrough inspections and building systems evaluations should be considered when planning renovations. *IAQ Design Tools for Schools (DTfS)*, a Web-based guide for establishing good IAQ practices into the design, construction, renovation, operation, and maintenance of K-12 school facilities (www.epa.gov/iaq/school design) can be utilized. These plans are summarized in [location].

To the extent possible, major renovations should be performed when school is not in session. If renovation projects must be performed while school is in session, the return air from any area being renovated should be isolated from the main ventilation system. Engineering controls should be used to contain and minimize the distribution of dust and other contaminants produced by construction activities. Cleaning operations should be more frequent during and after renovation.

Microbial Management

Microbials, such as mold, bacteria, and viruses, are a significant cause of illness, health symptoms, and discomfort. School staff should be aware that the easiest way to control microbial growth is to control moisture.

Signs of water intrusion and microbial growth should be investigated during the walkthrough inspections, building system evaluations, and other efforts. The maintenance staff should be informed about damaged buildings systems and components that cause water leaks and water condensation. School staff must make the necessary repairs and adjustments in a prompt manner. Materials damaged by water should be replaced when possible. Damp or wet materials must be dried within 48 hours (preferably within 24 hours).

Materials contaminated with microbials should be promptly cleaned or replaced. Mold growth should be removed from non-porous surfaces with a strong brush and non-ammonia containing detergent and thorough drying. Remediation projects that cannot be handled by district staff should be contracted to a professional. Large-scale remediation projects may require specific control and protection measures. For additional information on mold remediation, refer to EPA's guide, "Mold Remediation in Schools and Commercial Buildings" and EPA's Web site: www.epa.gov/mold.

Staff Education

All district employees play an important role in maintaining and improving air quality since their behavior can affect the quality of the air present in school buildings. For example, placing objects on unit ventilators, adjusting room thermostats, or turning off unit ventilators can worsen the quality of air in a room. An educated employee is more likely to take steps to maintain good air quality. In addition, an employee with an understanding of IAQ is more likely to report IAQ concerns quickly and accurately. For these reasons, the district staff must be educated about IAQ.

[School district's name] performs an annual IAQ training session, as part of the [name of training program, such as health and safety, employee right to know]. The [IAQ Coordinator or another qualified person] performs the training. The training includes [sessions from training agenda: for example, describe the importance of IAQ to health and learning].

The IAQ TFS Backgrounder and checklists (distributed annually) are educational tools. Staff should complete all the checklists. At a minimum, each year the Teacher's, Ventilation, and Building and Grounds Maintenance Checklists should be completed.

Communication

Communication is a critical element to successful IAQ management. The IAQ Coordinator and other district authorities try to limit misinformation and confusion through the use of effective communication. In order to develop and maintain the trust of the community and staff, the IAQ Coordinator and other designated district employees should communicate with relevant parties in a prompt, honest, and courteous manner until the issue is resolved. Every time an IAQ concern is addressed or resolved, the IAQ Coordinator should report the measures taken and the resolution of the identified concern to the appropriate parties.

In the unlikely event of an IAQ emergency, the district will accommodate the needs of students, parents, and staff. One or more contacts shall be selected to handle the media and update the community during a crisis. No one other than the district representative(s) should discuss IAQ-related issues with the press. The media will be alerted by [name of district's media contact] when it is necessary to provide information to a broader audience. Every effort will be made to share appropriate information as soon as it becomes available to the school district.

The IAQ Team and Coordinator will inform parents and staff about:

- The IAQ Management Plan and ongoing efforts, how to view the Plan upon request, and how to obtain an IAQ Concern Reporting Form.
- How to contact the IAQ Coordinator about IAQ issues.
- Where to find self-help information on how to evaluate IAQ in the school and to learn about structural features and operational practices of the school buildings.

[School district's name] provides this information to parents and staff using [name the media used (such as the school newsletter, "Right-to-Know" notification, the school district's Web site, or a letter) and time of year (usually the beginning)].

6. STAFF RESPONSIBILITIES FOR MAINTAINING GOOD IAQ

All staff members are responsible for improving and maintaining good IAQ [*tailor responsibilities to meet your school's needs*]:

- **Teachers** should refrain from interfering with airflow from ventilators (e.g., do not stack books or other items on ventilators, cover vents with posters, or turn off the fan due to noise), remove clutter in their classrooms, properly dispose of hazardous waste, and enforce the school's various IAQ policies in their classrooms.
- **Administrators** should communicate the school's activities to the school board, staff, students, and community. They also need to ensure that the school is implementing IAQ policies appropriately.
- **Facility operators** must ensure that HVAC systems are operating properly and that buildings are maintained adequately and cleaned regularly.
- **Custodians** need to follow all policies regarding cleaning chemicals, ensure that the school is regularly vacuumed and swept, clean drain pans, empty trash cans, and check drain pipes regularly. They should also look for signs of pest problems and inform the appropriate people of any issues.
- **Health Officers/School Nurses** should track illnesses, such as asthma, that may provide an early warning of IAQ problems.
- **The School Board** needs to approve the IAQ Management Plan. This approval shall include the date, a copy of the minutes from the meeting, and how often the Plan must be updated or reapproved (e.g., after every major change to the Plan, or every year, whichever comes first).

7. APPLICABLE LOCAL AND STATE REQUIREMENTS/REGULATIONS

[*School district's name*] will meet the following local and state requirements and regulations related to IAQ: [*List all local and state IAQ requirements and regulations that apply to school buildings. For example:*]

- *Non-smoking laws*
- *Asbestos regulations*

8. EMERGENCY RESPONSE

Emergency Response Policy

An emergency is defined as an unforeseen circumstance that requires immediate action, assistance, or relief. This includes situations that are potentially life threatening, such as:

- Spills of hazardous materials;
- Complaints of severe headaches, nausea, and combustion odors; and
- Diagnosed Legionnaire's disease or tuberculosis.

In addition, emergencies include situations where there is limited time available to prevent serious property damage, such as flooding in a carpeted area or health problems.

It is up to the discretion of the school administrators to identify and react to emergencies on a case-by-case basis, using the above definition as a general guideline only. If doubt exists about whether exposure to a specific hazard constitutes an emergency, a precautionary approach may be used where the matter is handled as an emergency. Non-emergency situations are addressed according to the "Reporting and Response Policy."

District officials must respond to emergencies immediately. If the problem cannot be resolved with in-house resources, external help should be acquired (e.g., local health agency, IAQ professionals). If a hazard poses an immediate health threat to the students and staff, the affected building areas must be evacuated. All avenues of communication need to be utilized to warn and inform affected or interested parties in a prompt manner.

IAQ Reporting and Response Policy

[School district's name] encourages the reporting of IAQ concerns, regardless of how trivial the issue may seem. The prompt reporting and resolution of IAQ issues has the potential to prevent serious problems from developing, which will help to prevent potential health effects, discomfort, and unnecessary costs. This makes the investigation of all reported concerns worthwhile.

The IAQ Coordinator should request concerned staff, students, and parents to report their IAQ concerns in writing. A written description of the concerns reduces misunderstanding and creates a history that can be referred to at a future date. All written concerns should be sent to the IAQ Coordinator to initiate an official IAQ concern reporting process. The resolution of the issue needs to be documented and the affected parties should be informed in writing about the measures taken. Information collected must be processed and stored according to the school district's policies.

9. STEPS FOR PREVENTION

[*School district's name*] is committed to preventing IAQ problems. To reach this goal, the district will complete the following activities:

- Every school must designate an IAQ contact, distribute and collect checklists, and report results to the IAQ Coordinator.
- The IAQ Coordinator should ensure that all IAQ efforts are coordinated and completed in a timely manner.
- All IAQ policies and programs (for radon, IPM, anti-idling, non-smoking, etc.) must be in place by [*date*].
- The school board, community, staff, unions, and students need to be updated on the district's IAQ efforts and carry out their responsibilities for maintaining good IAQ.
- Every school must complete an annual review to make changes to the IAQ Management Plan. The annual review is necessary because changes may occur in the building systems, components, occupants, and the administration's attitudes and priorities. The annual review involves:
 - Building systems evaluations;
 - Walkthrough inspections;
 - Reviewing IAQ concerns and other information;
 - Discussing new issues with the IAQ Team; and
 - Updating the IAQ Management Plan as needed.

A brief description of the changes to the Plan should be summarized and included in all future versions of the Plan. This documentation should reduce the likelihood of repeating policies and procedures that were ineffective or inefficient and ensure the success of the IAQ program.

Appendix A – IAQ Coordinator’s Forms

Make copies of the checklists and forms in this section so that the originals will be available for future use. The checklists and forms may be copied or modified according to your specific needs.

An electronic version is available at www.epa.gov/iaq/schools.

The IAQ Coordinator’s forms in this appendix include:

- Sample Memo for School Staff
- Sample Memo for Parents
- Sample Memo for Contract Service Providers
- Sample Memo for Local News Media
- *IAQ Management Plan Checklist* (2 pages)
- *IAQ Coordinator’s Checklist* (2 pages)
- *Checklist Log*
- Local IAQ Service Providers List
- *Problem Solving Checklist* (4 pages)



Sample Memo for School Staff

Forest Lake School

[Date]

Dear Staff Member,

This month, [Forest Lake] begins a new program to monitor and improve indoor air quality (IAQ) in our school. Enclosed is a copy of the *IAQ Backgrounder*, which is part of the U.S. Environmental Protection Agency (EPA) guidance that we are using in our school, and a checklist.

[Forest Lake] is proud to be taking a leadership role in providing a safe, comfortable, and productive environment for our students and staff so that we achieve our core mission—educating students. Our school will utilize EPA's guidance to improve our IAQ by preventing as many IAQ problems as possible and responding to any IAQ issues that may arise.

Good air quality requires an ongoing commitment from everyone in our school. We all make daily decisions and perform activities that affect the quality of the air we breathe. You can make an important contribution to this IAQ improvement program by reading the background information and applying the simple, yet important, activities in your checklist (attached).

When you have read the *IAQ Backgrounder* and completed the checklist, return the checklist to our IAQ Coordinator, [name], so that [he or she] can follow up on any IAQ concerns. [Name] has agreed to administer the IAQ Management Plan, which includes taking a team leadership role, coordinating emergency response, and serving as our information resource on IAQ. Contact [name] at [phone, e-mail address, and room number] with questions or concerns, and return the checklist to [him or her] by [date].

The school newsletter and Web site will provide progress reports as we implement our IAQ Plan.

Sincerely,

[Name]

[Principal or Superintendent]

Enclosures: *IAQ Backgrounder*, [Appropriate title] *Checklist*

Sample Memo for Parents

Forest Lake School

[Date]

Dear [Parent]:

This month, [Forest Lake] begins a new program to monitor and improve indoor air quality (IAQ) in our school. We are proud to be taking a leadership role in providing a safe, comfortable, and productive environment for our students and staff so that we achieve our core mission—educating students. Our school will utilize guidance provided by the U.S. Environmental Protection Agency to prevent IAQ problems and respond to any IAQ issues that may arise.

Enclosed is a copy of the *IAQ Backgrounder*, which is part of the EPA guidance that we are using in our school. Not only is this basic information useful to schools, you may also find it useful for application in your own home.

[Name] has agreed to administer the IAQ program in our school. If you have any questions or concerns, please do not hesitate to contact [name] at [phone, e-mail address, and room number].

The school newsletter and Web site will carry progress reports as we learn more about IAQ in our school.

Sincerely,

[Name]

[Principal or Superintendent]

Enclosure: *IAQ Backgrounder*

Sample Memo for Contract Service Providers

Forest Lake School

[Date]

Dear [Name of Contract Service Provider],

[Forest Lake] is proud to be taking a leadership role in providing a safe, comfortable, and productive environment for our students and staff so that we achieve our core mission—educating students.

Therefore, [Forest Lake] is implementing a program to monitor and improve indoor air quality (IAQ) in our school. The work you perform in our school can have an impact on the quality of the school's air. I have enclosed specific guidance provided by the U.S. Environmental Protection Agency that shows how you can help us make this effort a success.

Your involvement is important. Please read the enclosed *IAQ Background* and IAQ checklist.

If you have any questions or concerns, please do not hesitate to contact [name] at [phone, e-mail address, and room number].

Sincerely,

[Name]

IAQ Coordinator

Enclosures: *IAQ Background*, [Appropriate title] *Checklist*

Sample Memo for Local News Media

Forest Lake School

[Date]

Dear [Local News Media Person]:

This month, [Forest Lake] begins a new program to monitor and improve indoor air quality (IAQ) in our school. We are proud to be taking a leadership role in providing a safe, comfortable, and productive environment for our students and staff so that we achieve our core mission—educating students. Our school will utilize guidance provided by the U.S. Environmental Protection Agency to improve IAQ, prevent IAQ problems, and respond to any IAQ issues that may arise.

As a prominent source of information on events in our local area, you can be helpful in assuring that timely and accurate information regarding IAQ in our school reaches the parents of students and other concerned constituents. Enclosed is a copy of the *IAQ Background*, which is part of the EPA guidance that we are using in our school.

If you have any questions regarding IAQ in our school, please do not hesitate to contact our IAQ Coordinator [name]. [Name] has agreed to administer the IAQ Management Plan, which includes taking a team leadership role, coordinating emergency response, and serving as our information resource on IAQ. [Name] can be contacted at [phone].

Sincerely,

[Name]

[Principal or Superintendent]

Enclosure: *IAQ Background*

IAQ Management Plan Checklist

IAQ Coordinator _____ School _____ Date Completed _____

Use the checklist below to record and monitor the steps you have taken to activate the IAQ Management Plan.

| Steps Taken | Date | Comments/Notes |
|---|------|----------------|
| 1. Selected IAQ Coordinator Name: _____ | | |
| 2. Read Guidance | | |
| 3. Obtained Administrative Support | | |
| 4. Indicated Problems with: <input type="checkbox"/> Radon <input type="checkbox"/> Hazardous Materials <input type="checkbox"/> Asbestos <input type="checkbox"/> Pest Managment <input type="checkbox"/> Lead <input type="checkbox"/> Idling Vehicles <input type="checkbox"/> Smoking | | |
| 5. Established IAQ Checklist Interval Number of times each year: _____ | | |
| 6. Prepared Emergency Response <input type="checkbox"/> Contacted local health agency <input type="checkbox"/> Identified and contacted IAQ professional(s) | | |

| Steps Taken | Date | Comments/Notes |
|--|------|----------------|
| 6. Prepared Emergency Response (cont.) | | |
| <input type="checkbox"/> Prepared or identified equipment and supplies for wet carpets or contacted local professional cleaning firm | | |
| <input type="checkbox"/> Completed local IAQ Service Providers form | | |
| 7. Procedures Established for: | | |
| <input type="checkbox"/> Cleaning and Chemicals | | |
| <input type="checkbox"/> Flooring and Furnishings | | |
| <input type="checkbox"/> Preventive Maintenance and Operations | | |
| <input type="checkbox"/> Construction and Renovation | | |
| <input type="checkbox"/> Microbial Management | | |
| <input type="checkbox"/> Staff Education | | |
| <input type="checkbox"/> Communication | | |
| <input type="checkbox"/> Others: | | |
| 8. Prepared and Distributed IAQ Policies | | |
| <input type="checkbox"/> Nonsmoking | | |
| <input type="checkbox"/> Integrated Pest Management | | |
| <input type="checkbox"/> Asbestos | | |
| <input type="checkbox"/> Painting | | |
| <input type="checkbox"/> Lead | | |
| <input type="checkbox"/> Radon | | |
| <input type="checkbox"/> Anti-Idling | | |
| <input type="checkbox"/> Others: | | |

Checklist Log

IAQ Coordinator _____ School _____

Use this log to keep track of who has received a checklist, returned checklist(s), unresolved problem(s), problems resolved and corresponding dates.

Also, this log can be used to record distribution of information to parents, school board members, contract service providers, unions, and local media.

[illegible]

Local IAQ Service Providers List

| | | | | |
|-----------------------------|------|---------|-----------|---------|
| Hazardous Materials Hotline | FIRM | CONTACT | PHONE | ADDRESS |
| | | TITLE | EMERGENCY | |
| Local Health Department | FIRM | CONTACT | PHONE | ADDRESS |
| | | TITLE | EMERGENCY | |
| State Health Department | FIRM | CONTACT | PHONE | ADDRESS |
| | | TITLE | EMERGENCY | |
| Carpet Cleaner | FIRM | CONTACT | PHONE | ADDRESS |
| | | TITLE | EMERGENCY | |
| IAQ Consultant | FIRM | CONTACT | PHONE | ADDRESS |
| | | TITLE | EMERGENCY | |
| Mechanical Systems Operator | FIRM | CONTACT | PHONE | ADDRESS |
| | | TITLE | EMERGENCY | |
| | FIRM | CONTACT | PHONE | ADDRESS |
| | | TITLE | EMERGENCY | |
| | FIRM | CONTACT | PHONE | ADDRESS |
| | | TITLE | EMERGENCY | |
| | FIRM | CONTACT | PHONE | ADDRESS |
| | | TITLE | EMERGENCY | |
| | FIRM | CONTACT | PHONE | ADDRESS |
| | | TITLE | EMERGENCY | |

Problem Solving Checklist

Use this checklist with the IAQ Problem Solving Wheel to resolve a single IAQ complaint or several complaints occurring at the same time that seem related. Mark a copy of the fire escape floorplan or use other means of recording and reviewing information. Since this checklist becomes a record of your activities in resolving IAQ complaint(s), date it and file it for future reference. Involve additional staff, such as engineers, during the problem-solving process.

IAQ Coordinator

School

Reports of IAQ Problems

Record complaints below at the beginning of your problem-solving process. Interview the complainant(s) to get a complete and accurate description of any symptoms, times, and locations.

| Complainant Name | Date Received | Description of Complaint (symptoms or explanation) | Location(s) or Room Number(s) | Is Problem Ongoing? | Occurrence Date(s) & Time(s) |
|------------------|---------------|--|-------------------------------|---|------------------------------|
| | | | | <input type="checkbox"/> Yes <input type="checkbox"/> No | |
| | | | | <input type="checkbox"/> Yes <input type="checkbox"/> No | |
| | | | | <input type="checkbox"/> Yes <input type="checkbox"/> No | |
| | | | | <input type="checkbox"/> Yes <input type="checkbox"/> No | |
| | | | | <input type="checkbox"/> Yes <input type="checkbox"/> No | |
| | | | | <input type="checkbox"/> Yes <input type="checkbox"/> No | |
| | | | | <input type="checkbox"/> Yes <input type="checkbox"/> No | |
| | | | | <input type="checkbox"/> Yes <input type="checkbox"/> No | |
| | | | | <input type="checkbox"/> Yes <input type="checkbox"/> No | |
| | | | | <input type="checkbox"/> Yes <input type="checkbox"/> No | |

Problem Solving Steps

Follow the directions on the IAQ Problem Solving Wheel to investigate potential causes of the symptoms recorded above. Use the step below to help keep your investigation organized and documented.

| Step | Date Completed | Notes |
|---|----------------|--|
| 1. Relate the symptoms from the complaint data box to a group of symptoms in the Notes column to the right. | | <div><input type="checkbox"/> Odors</div> <div><input type="checkbox"/> Temperature or humidity problems (occupant discomfort)</div> <div><input type="checkbox"/> Headaches, lethargy, nausea, drowsiness, and dizziness</div> <div><input type="checkbox"/> Swelling, itching, or irritated eyes, nose, or throat; congestion</div> <div><input type="checkbox"/> Cough, chest tightness, shortness of breath, fever, chills, fatigue</div> <div><input type="checkbox"/> Diagnosed infection or clusters of serious health problems</div> |

| Step | Date Completed | Notes |
|---|----------------|---|
| 2. Is this an emergency? <input type="checkbox"/> Yes <input type="checkbox"/> No See the Problem Solving Wheel's sectors "Identifying an emergency" and "What to do in an emergency." | | Actions Taken: <input type="checkbox"/> Evacuation <input type="checkbox"/> Notification <input type="checkbox"/> Other: |
| 3. Place a checkmark next to the potential causes in Step 4 below that are shown at 2 on the Wheel. | | |

4. Each section below corresponds to a section of the IAQ Problem Solving Wheel. Use this area to record diagnostics you perform. Three spaces are provided below for each diagnostic step to allow you to record information for more than one location or piece of equipment. Make extra copies of this form as necessary. Please note that some of the steps may not apply to your building.

| Step | Date Completed (for each location if more than one location or piece of equipment is involved) | | | Notes |
|--|--|---|---|-------|
| | 1 | 2 | 3 | |
| <input type="checkbox"/> Temperature & Humidity <ul style="list-style-type: none"> ■ Is thermostat properly set? ■ Is air flowing from the vent warm (for heat) or cool (for air conditioning)? ■ Are drafts or direct sunlight causing discomfort? ■ Is humidity between 30-60% relative humidity (recommended)? ■ Is condensation often present on windows or other cold surfaces? ■ Is there an objectionable odor? | | | | |
| <input type="checkbox"/> Outdoor Air Supply <ul style="list-style-type: none"> ■ Is the ventilation system turned on? ■ Is the outdoor intake blocked? ■ Are supply vent(s) blocked? ■ Is air flowing from supply vent(s)? ■ Is air flowing into outdoor intake? ■ Are outdoor air or supply ducts blocked? ■ Is outdoor air supply at least 15 cfm per occupant? ■ Is CO₂ in the area higher than 1000 ppm? | | | | |
| <input type="checkbox"/> Air Handling Unit <ul style="list-style-type: none"> ■ Is the system turned on? ■ Is the air flowing from vent(s)? ■ Is the fan operating? ■ Is the filter(s) clean & properly installed? ■ Are dampers operating properly? ■ Is there moisture, debris or microbial growth in or around the unit? ■ Is the drain pan clean & draining? ■ Are the coils clean? ■ Is combustion equipment properly vented (no flue leaks, spillage, or backdrafting)? | | | | |

| Step | Date Completed (for each location if more than one location or piece of equipment is involved) | | | Notes |
|--|--|---|---|-------|
| | 1 | 2 | 3 | |
| <input type="checkbox"/> Local Exhaust <ul style="list-style-type: none"> Does the exhaust system turn on? Is the exhaust used consistently? Is air flowing from the exhaust vent? Is exhaust duct work blocked? Is a sufficient amount of air being exhausted? If everything works, but not enough air is being exhausted, can make-up air easily enter the room (e.g., through spaces under doors)? | | | | |
| <input type="checkbox"/> Biological Sources <ul style="list-style-type: none"> Are animals or fungi (mold) present? Is there an odor of mold or mildew? Are supply vent(s) blocked? Is there standing water near the complaint area or in the air handling unit? Is condensation often present on windows or cold surfaces? Is indoor relative humidity above 60%? Are contagious occupants present? | | | | |
| <input type="checkbox"/> Housekeeping Sources <ul style="list-style-type: none"> Do complaints occur during or just after housekeeping activities? Do housekeeping activities take place near the complainants? Are any new products in use? Are housekeeping products being used according to directions? Are products stored in sealed containers or in a vented room(s)? | | | | |
| <input type="checkbox"/> Outdoor Sources <ul style="list-style-type: none"> Are sources of odor or pollutants (e.g., vehicles, stored chemicals, trash, plumbing vents) located near outdoor air intakes? Are there sources nearby or upwind: <ul style="list-style-type: none"> Combustion byproducts from traffic, loading docks or flue exhausts? Industrial, agricultural or lawn care activity? Construction activity? Are pollen levels high? | | | | |
| <input type="checkbox"/> Building Sources <ul style="list-style-type: none"> Has there been recent painting, roofing, or other remodeling or construction? Were pesticides applied recently near the complaint area? Are new furnishing or equipment in place? Are drain traps dry? Are chemicals stored in properly sealed containers? Is the building overly dusty? | | | | |

| Step | Date Completed | Notes |
|---|----------------|--|
| 5. Repeat all diagnostics for each potential cause in all affected locations. | | |
| 6. If the diagnostics for the recommended potential causes did not identify the problem(s), investigate remaining potential causes in Step 4 until the cause(s) of the complaint(s) are identified and corrected. | | |
| 7. If problem remains unidentified or uncorrected, obtain professional assistance. | | Company: Person: Phone: |
| 8. Provide notice if problem is not quickly resolved. | | <input type="checkbox"/> Notice to occupants <input type="checkbox"/> Notice to parents of minors |
| 9. Problem resolved and preventive measures taken. | | Describe solution: <input type="checkbox"/> Preventive measures taken: |
| 10. Provide a final report. | | |
| 11. To prevent future problems, implement an IAQ Management Plan. | | |
| 12. File this Checklist and related information | | |

Appendix B – Developing Indoor Air Policies



An IAQ policy statement demonstrates a strong commitment by the school administration to address the health and comfort of staff and students, as well as the environmental quality in the school. In addition, an IAQ policy sets an overall direction for efforts to prevent and correct IAQ problems. General issues that may require policies include, but are not limited to: Painting, smoking, renovations and repairs, pest management, ventilation system operation, school supply and purchasing, food or pets in the classroom, disinfectants, vehicle idling, and maintenance schedules.

This appendix presents general considerations related to developing an IAQ policy. In addition, it presents four sample IAQ policies targeted to specific indoor pollutant sources. The first sample is a policy on integrated pest management (IPM). The second sample is a memo and letter to parents regarding painting. The third sample is a policy that limits bus idling on school grounds and includes a sample memo to bus drivers about anti-idling procedures. The final sample is a nonsmoking policy, including a sample letter to staff. The samples presented are intended only as guides, and may be modified in any way to meet the site-specific needs and intent of individual schools.

GENERAL CONSIDERATIONS

An IAQ policy should include the following components:

- A statement indicating that the school administration's commitment to good IAQ and the health, safety, and comfort of staff and students.
- A statement indicating the intent to identify, prevent, and correct IAQ problems.
- Authorization of an IAQ Coordinator for each school or district and delegation of authorities to the IAQ Coordinator.

- Guidance on appropriate steps for maintaining good IAQ (see specific activities in the various IAQ checklists for ideas).
- Guidance on appropriate actions for correcting IAQ problems.
- Reporting requirements.

Developing an IAQ policy should be an open process. A health and safety committee is a good forum for developing consensus recommendations. In the absence of an existing committee, consider establishing an ad hoc committee comprised of administrators, teachers, support personnel, school health officers, maintenance personnel, physicians, union representatives, and community leaders. Interested parents may also wish to serve on this committee.

Sample Pest Management Policy Statement

When a pesticide must be used to meet important management goals, the least hazardous material adequate to control the pest should be chosen and label directions should be followed exactly. The application of pesticides may be subject to school district policies and procedures, the Federal Insecticide, Fungicide, and Rodenticide Act (7 United States Code 136 et seq.), EPA regulations in 40 Code of Federal Regulations, OSHA regulations, and state and local regulations.

Pests

Pests are unwanted populations of living organisms (animals, plants, or microorganisms). Strategies for managing pest populations will be influenced by the pest species and whether that species poses a threat to people, property, or the environment.

Pest Management

Approved pest management plans should be developed for the site and should include proposed pest management measures to:

- Reduce any potential human health hazard or to protect against a significant threat to public safety.
- Prevent loss of or damage to school structures or property.
- Prevent pests from spreading into the community or to plant and animal populations beyond the site.
- Enhance the quality of life to students, staff, and others.

Integrated Pest Management Procedures

Integrated pest management (IPM) procedures will be used to determine when to control pests and whether to use mechanical, physical, chemical, or biological means. IPM practitioners depend on current, comprehensive information about the pest and its environment, and the best available pest control methods. Applying IPM principles prevents unacceptable levels of pest activity and damage by the most economical means and with the least possible hazard to people, property, and the environment.

The decision to use a pesticide will be based on a review of all other available options and a determination that these options are not acceptable or are not feasible. Cost or staffing considerations alone will not be adequate justification for use of chemical control agents, and selected non-chemical pest management methods will be implemented whenever possible to provide the desired control. It is the policy of this school district to utilize IPM principles to manage pest populations adequately. The full range of alternatives, including no action, will be considered.

Continued...

Education

Staff, students, pest managers, and the public will be educated about potential school pest problems and the IPM policies and procedures that will be implemented.

Record Keeping

Records of pesticide use shall be maintained onsite to meet the requirements of the state regulatory agency and school board. Records must be current and accurate for IPM to be effective. In addition, pest surveillance data sheets that record the number of pests or other indicators of pest populations should be maintained to verify the need for treatments.

Notification

[School name] will be responsible for notifying school staff and parents in advance of any pesticide applications.

Pesticide Storage and Purchase

Pesticide purchases will be limited to the amount authorized by [committee/department] for use during the year. Pesticides will be stored and disposed of in accordance with the EPA-registered label directions and state regulations. Pesticides must be stored in an area inaccessible to students or unauthorized personnel.

Pesticide Applicators

Pesticide applicators must have a working knowledge of the principles and practices of IPM and use only pesticides approved by this school district. They must follow regulations and label precautions. Applicators must comply with this school district IPM policy and pest management plan.

Pests and pesticides can pose significant problems and risks to people, property, and the environment. It is, therefore, the policy of [school name] to incorporate IPM procedures for control of structural and landscape pests. This policy will minimize the amount and toxicity of pesticides used in the school.

Sample Painting Memo

MEMORANDUM

TO: School Principal

FROM: District Facilities Manager

This memo and attachments are provided for your use in preparation for the interior painting of your school. Based on past experience, certain steps must be taken by the school prior to painting to ensure minimal disruption to the teaching process and to ensure that maximum information is communicated to the parents.

The Paint Foreman or a designated representative will meet with you no later than one month prior to the start of work to coordinate the effort and discuss any items that may be of interest to you. Classrooms or other confined spaces must be vacated throughout the painting process. The attached Material Safety Data Sheets will provide information on drying time and other precautions that must be taken. The principal reserves the right not to allow occupancy of a classroom until he/she is satisfied that it will not pose a hazard to the students. The paint crew can complete an average classroom in 1 day.

As it pertains to cafeterias, painting will not start until after lunch is completed. This means painting will occur only 2 to 3 hours in the afternoon each working day. Thus, the painting of this area will likely take longer than in any other part of the school.

The attached notices to parents are provided for school consideration. All parents must be notified by some means. Two choices are offered, one in the form of an official memorandum; the other less formal option is a "flyer."

Parents may express concern over their child's presence in school during the painting. Since the length of time required to paint the interior of your school will be a minimum of [# of months], this issue should be resolved mutually on a case-by-case basis.

If you have any questions concerning this memo or the painting process, please contact [contact name], or discuss your questions or concerns at the scheduled pre-painting meeting.

Sample Parental Notification Letter for School Painting

Name

Address

City, State, Zip Code

Dear Parent or Guardian:

The Maintenance Division plans to start painting in our school on or about [day and date]. The school building is an important factor in the success of the total educational program. Proper maintenance of school buildings is necessary to provide a healthy and pleasant atmosphere. The majority of paint being used in [name] Public Schools is latex water-based. Some heavy traffic areas and trim will require the use of oil-based paint. Paints containing lead or mercury are never used in school painting.

Instructional areas will be unoccupied during painting and drying times. We anticipate that paint crews will be in the school for a period of [# of days], beginning on [day and date].

The health and safety of all students is a primary consideration as the painting crews undertake this maintenance and beautification project. If you have any questions or concerns about the scheduled painting, please feel free to contact me at [phone #].

With the cooperation of parents, students, and staff, this painting project will result in a bright, new look for our school. I hope you will stop by when the project is completed to see the results for yourself!

Sincerely,

Principal

Anti-Idling Policy

This section includes a sample anti-idling policy and memo. The announcement letter should address the main issues covered by the school's anti-idling policy:

- Explicitly state when/where/for how long buses are allowed to idle.
- Define individuals and vehicles covered by the policy.
- Outline the stages and dates of policy implementation.
- State the enforcement procedures taken when the policy is violated.
- Identify the appropriate contact for questions and concerns.

The sample policy is intended to provide a framework for developing an anti-idling policy and highlights issues of emission exposure and health concerns. The level of detail and specificity of any policy will depend on the type of school, the actions to be taken, and the level of communication required to reach all affected individuals. A simple, clear-cut policy, for example, will require few specifics and will be easily monitored.

The anti-idling policy should be placed in the personnel manual (including that of bus drivers), employee handbook, school by-laws, or another location that will facilitate the distribution of this

information to all affected individuals. Signs can also be posted in areas where cars, buses, or delivery trucks wait to remind drivers that their engines should be turned off.

Following is a sample anti-idling policy that reduces idling on school grounds.

For additional information on mobile sources and anti-idling, see **Appendix I: "Mobile Sources"** in the *IAQ Reference Guide*.

Sample Anti-Idling Policy:

[Forest Lake School] is committed to providing a healthy and productive environment for all persons using our school. In light of the significant risk posed by school bus exhaust emissions, especially to children, [Forest Lake] is implementing an [anti-idling policy or limited bus idling policy]. This policy is intended to improve the health and safety of all individuals in or around the school and school grounds and reduce risks associated with exposure to diesel exhaust (such as aggravated respiratory and cardiovascular conditions, decreased lung function, acute respiratory symptoms, and chronic bronchitis). Queueing of buses for pick-up and drop-off as well as periods of idling during the bus commute itself can cause particular problems. The following steps indicate the exact timing of specific changes to current operations and outline the procedures for conflict resolution and enforcement:

A. Implementation of Policy to [Eliminate or Reduce] Exposure to School Bus Exhaust Emissions, also known as diesel exhaust emissions.

Beginning immediately, [Forest Lake] requires all buses to limit their idling on school grounds to improve surrounding air quality; protect the health of drivers, students, and others; conserve fuel (save money); and decrease engine wear.

B. Policy Guidelines to Reduce Exposure to School Bus Exhaust Emissions.

This rule applies to any bus service, including home-to-school, activity, or charter transportation.

1. To the extent possible, eliminate idling upon reaching your destination:
 - While waiting for passengers to board at place of origin, all engines should be shut off.
 - When arriving at your location, all buses should be shut off as soon as it is practical; buses should not idle while waiting for passengers.
2. During morning start-up, buses should idle no longer than necessary to bring engines to proper operating temperature and to defrost all windows.
3. Exceptions to the policy may be made when the air temperature is below 32 degrees, and when it is necessary to run the engine to operate required safety equipment or to maintain a safe environment for passengers with special health needs. The **guidelines** for maximum engine idling are:
 - Above 32° F: 3 minutes
 - Between -10° and 32° F: 10 minutes
 - Below -10° F: no limit
4. Signs will be posted to remind all (car, bus, and truck) drivers of our school's Anti-Idling Policy.

Sample Anti-Idling Policy (cont.):

C. Conflict Resolution

Bus drivers, employees, and visitors are expected to honor the anti-idling policy at all school buildings and facilities by shutting off their engines upon arrival. Individual complaints or concerns regarding the implementation and/or enforcement of this policy should be discussed with the school bus fleet manager, [designated person], who will contact the individual bus driver. Concerns about staff or parents who idle their vehicles on school grounds can be directed to [designated person] at [phone #].

D. Enforcement of Policy

All persons share in the responsibility of adhering to and enforcing this policy. Any person violating this policy will be subject to the similar disciplinary actions that accompany other infractions of our policies including:

- Oral reminder
- Written reprimand
- Probation

Sample Anti-Idling Letter:

To: All School Bus Drivers

Re: Limiting Bus Idling

The [State School Transportation Association] has teamed up with the [State Environmental Agency] and the [Local School District] to protect school children and each of you from excessive exposure to diesel exhaust emissions. As part of this effort, we support and encourage you to follow their guidelines restricting engine idling time whenever practical, effective immediately.

To the extent possible, eliminate idling:

- While waiting for passengers to board at place of origin, shut off all engines.
- When arriving at your location, shut off all buses as soon as it is practical.
- Guidelines for maximum engine idling [consistent with existing state regulations]:

Above 32° F: 3 minutes

Between -10° and 32° F: 10 minutes

Below -10° F: no limit

Please help us do our part to reduce air pollution and protect children's (and your own) health. Minimizing vehicle idling will also save money by reducing fuel consumption and engine wear.

Thank you for your support and cooperation with this effort.
[School district] School Bus Drivers Doing Their Share for Clean Air!

Sincerely yours,

Fleet Manager

Nonsmoking Policy:

This section includes a sample announcement for a nonsmoking policy and memo. The announcement letter should address the following main issues covered by the school's nonsmoking policy:

- Explicitly state where smoking is prohibited and permitted (if permitted at all).
- Define individuals who are covered by the policy.
- Clarify exactly what constitutes smoking.
- Outline the stages and dates of policy implementation.
- State the enforcement procedures taken when the policy is violated.
- Identify the appropriate contact for questions and concerns.

The policy may also include information on smoking cessation or other staff education programs being offered or covered by the school.

The sample policy is intended to provide a framework for developing a nonsmoking policy and highlights issues of particular importance for both large and small schools. The level of detail and specificity of any policy will depend on the type of school, the actions to be taken, and the level of communication required to reach all affected individuals. A simple, clear-cut policy, for example, will require few specifics and will be easily enforced.

The nonsmoking policy should be placed in the personnel manual, employee handbook, school by-laws, or another location that will facilitate the distribution of this information to all affected individuals.

The following sample nonsmoking policy eliminates smoking indoors. If separately ventilated designated smoking rooms are being provided, this policy can be easily revised by omitting the step about eliminating smoking on all school grounds. Add specifics regarding additional enforcement procedures for potential and repeated infractions.

For additional information on secondhand smoke, see **Appendix F**: “Secondhand Smoke” in the *IAQ Reference Guide*.

Sample Nonsmoking Policy:

[Forest Lake School] is committed to providing a healthy and productive environment for all persons using our school. In light of the significant risk posed by secondhand tobacco smoke to human health as well as to sensitive equipment, [Forest Lake] has decided to implement a [nonsmoking policy or smoke control policy]. This policy is intended to improve the health and safety of all individuals using the school. The following steps indicate the exact timing of specific changes to current operations and outline the procedures for conflict resolution and enforcement.

I. Implementation of Policy to [Eliminate or Reduce] Exposure to Secondhand Smoke, also known as Environmental Tobacco Smoke (ETS)

- A. Beginning in [month, date], [Forest Lake] will offer smoking cessation programs to all school staff.
- B. Effective immediately, smoking will be prohibited on [Forest Lake] all school grounds. “No Smoking” signs will be posted as necessary to remind personnel and visitors of this policy.

[Alternative Text for Separately Ventilated Smoking Room Policy:
Effective [October 1], smoking will be prohibited in meetings and all enclosed areas including conference rooms, offices, and restrooms. Smoking will also be prohibited in all common areas including the cafeteria, breakrooms, hallways, reception areas, and outside building entrances. “No Smoking” signs will be posted in the restricted areas. Smoking will be permitted only in designated rooms that have been equipped with separate exhaust fans that isolate environmental tobacco smoke from nonsmoking areas. [NOTE: See **Appendix F** of the *IAQ Reference Guide* if school is receiving Federal funding.]]

II. Conflict Resolution

Employees and visitors are expected to honor the smoking restrictions at all school buildings and facilities. Individual complaints or concerns regarding the implementation and/or enforcement of this policy should be discussed with your supervisor [or other designated person]. If the supervisor is unable to resolve the individual complaint or concern, the employee may request that their concern be directed to the Nonsmoking Policy Committee [or other designated person or committee].

III. Enforcement of Policy

All persons share in the responsibility of adhering to and enforcing this policy. Any person violating this policy will be subject to the same disciplinary actions that accompany any infraction of our policies including:

- Employee counseling
- Oral reminder
- Written reprimand
- Probation
- Termination

Sample Nonsmoking Memo:

MEMORANDUM

To: All [Forest Lake] School Staff

From: [Name], Principal

Re: [Forest Lake's] Nonsmoking Policy

In response to increasing staff concern and the U.S. Environmental Protection Agency's (EPA) findings that secondhand smoke may be harmful to children's health, [Forest Lake] is instituting a smoke-free workplace policy, effective immediately. This policy applies to all property owned or leased by [Forest Lake] and includes all offices, hallways, waiting rooms, restrooms, lunchrooms, elevators, meeting rooms, and community areas. This policy applies to all staff and visitors. Smoking will not be allowed in areas adjacent to the building entrances.

[Forest Lake] considers any use of tobacco products that produce smoke as smoking. This definition includes, but is not limited to, cigars, cigarettes, and pipes.

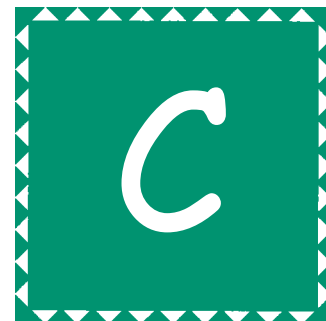
[Forest Lake] has taken several steps to facilitate a smooth transition to a smoke-free workplace:

- The policy will begin immediately.
- Beginning in [month], a smoking cessation class will be offered for individuals who would like to take this opportunity to quit smoking. Smoking cessation classes will continue to be offered through [month & year].
- Effective [date], smoking will be prohibited in all common areas.
- Effective [date], smoking will be prohibited throughout all buildings.

The success of this policy will depend upon the thoughtfulness, consideration, and cooperation of smokers and nonsmokers. Everyone shares in the responsibility for adhering to and enforcing the policy. Any problems should be brought to the attention of the appropriate supervisor and handled through the normal chain of command. Individuals who violate this policy will be subject to the same disciplinary actions that accompany infraction of other school rules. Refer to your employee handbook for disciplinary policies.

The [Forest Lake] school administration welcomes questions and comments regarding the new nonsmoking policy. Please feel free to contact our Indoor Air Quality Coordinator, [name], at extension [####]; [he/she] will be happy to respond to your questions and concerns and can provide information on the health effects of secondhand tobacco smoke.

Appendix C – Glossary and Acronyms



Disinfectants – One of three groups of antimicrobials registered by EPA for public health concerns. A disinfectant destroys or irreversibly inactivates undesirable (and often infectious) organisms. EPA registers three types of disinfectant products based upon submitted efficacy data: limited, general/broad spectrum, and hospital disinfectant.

Drain Trap – A dip in the drain pipe of sinks, toilets, floor drains, etc., that is designed to stay filled with water in order to prevent sewer gases from escaping into the room.

Emissions – Releases of pollutants into the air from a source, such as a paints, furniture, or cleaning agents.

EPA – United States Environmental Protection Agency. See **Appendix L**: “Resources” in the *IAQ Reference Guide* for more information.

ETS – Environmental Tobacco Smoke. Mixture of smoke from the burning end of a cigarette, pipe, or cigar and smoke exhaled by the smoker (also secondhand smoke or passive smoking). See the following appendices in the *IAQ Reference Guide* for more information: **Appendix E**: “Typical Indoor Air Pollutants,” **Appendix F**: “Secondhand Smoke,” and **Appendix L**: “Resources.”

IAQ – Indoor air quality.

IAQ Backgrounder – A general introduction provided in the *IAQ TFS Kit* that describes IAQ issues as well as IAQ program implementation.

IAQ Checklists – Various lists provided in the *IAQ TFS Kit* that contain simple activities for school staff to improve or maintain good indoor air quality. Each focuses on topic areas and actions that are targeted to particular school staff (e.g., teachers, administrators, kitchen staff, maintenance staff) or specific building functions (e.g., HVAC system, roofing, renovation). The checklists are to be completed by the staff and returned to the IAQ Coordinator as a record of completed activities and requested assistance.

IAQ Coordinator – An individual at the school and/or school district level who provides leadership and coordination of IAQ activities. See **Section 2**: “Role and Functions of the IAQ Coordinator” for more information.

IAQ Management Plan – A set of flexible and specific steps for preventing and resolving IAQ problems. See **Section 4**: “What is an IAQ Management Plan?” for more information.

IAQ Team – Individuals working directly with the IAQ Coordinator to address IAQ in the school(s). These individuals may include school staff, administrators, school board members, students and parents. A district-wide IAQ Team should ensure members represent the entire district. The team distributes the information packets (IAQ Backgrounder, memo, and checklists) to school staff. See **Section 3**: “Assembling the IAQ Team,” for more information.

Indoor Air Pollutant – An indoor contaminant such as particles, dust, fibers, mists, bioaerosols, and gases. See the following sections in the *IAQ Reference Guide* for more information: **Section 2**: “Understanding IAQ Problems” and **Appendix E**: “Typical Indoor Air Pollutants.”

Indoor Pollutant Sources – Indoor air pollutants can originate within the building or be drawn in from outdoors. Common sources include people, carpets, photocopiers, art supplies, furniture, vehicles, paints, etc. See **Section 2**: “Understanding IAQ Problems” in the *IAQ Reference Guide* for more information.

IPM – Integrated Pest Management. A comprehensive approach to eliminating and preventing pest problems with an emphasis on reducing pest habitat and food sources. See **Appendix K**: “Integrated Pest Management” in the *IAQ Reference Guide* and **Appendix B**: “Developing Indoor Air Policies,” for more information.

Mobile Sources – Motor vehicles, engines, and equipment that move, or can be moved, from place to place. Mobile sources include vehicles that operate on roads and highways (“on-road” or “highway” vehicles), as well as nonroad vehicles, engines, and equipment. Examples of mobile sources are cars, trucks, buses, earth-moving equipment, lawn and garden power tools, ships, railroad locomotives, and airplanes.

Negative Pressure – Condition that exists when less air is supplied to a space than is exhausted from the space, so the air pressure within that space is less than that in surrounding areas. Under this condition, if an opening exists, air will flow from surrounding areas into the negatively pressurized space.

Outdoor Air Supply – Air brought into a building from the outdoors (often through the ventilation system).

Pollutants (Pollution) – Unwanted chemicals or contaminants found in the environment. Pollutants can harm human health, the environment, and property. Air pollutants occur as gases, liquid droplets, and solids. Once released into the environment, many pollutants can persist, travel long distances, and move from one environmental medium (e.g., air, water, soil) to another.

Pollutant Pathways – Avenues for distribution of pollutants in a building. HVAC systems are the primary pathways in most buildings; however all building components and occupants interact to affect how pollutants are distributed. See **Section 2: “Understanding IAQ Problems”** in the *IAQ Reference Guide* for more information.

Positive Pressure – Condition that exists when more air is supplied to a space than is exhausted, so the air pressure within that space is greater than that in surrounding areas. Under this condition, if an opening exists, air will flow from the positively pressurized space into surrounding areas.

Preventive Maintenance – Regular and systematic inspection/tune-up, cleaning, and replacement of worn parts, materials, and systems. Preventive maintenance helps to prevent parts, material, and systems failure by ensuring that parts, materials, and systems are in good working order.

Radon – A colorless, odorless gas that occurs naturally in almost all soil and rock. Radon migrates through the soil and groundwater and can enter buildings through cracks or other openings in the foundation. Radon can also enter through well water. Exposure to radon can cause lung cancer. See the following sections in the *IAQ Reference Guide* for more information: **Appendix G: “Radon”** and **Appendix E: “Typical Indoor Air Pollutants.”**

Re-circulation – Situation that occurs when the air exhausted from a building is immediately brought back into the system through the air intake and other openings in the building envelope.

Secondhand Smoke – See **Appendix F: “Secondhand Smoke”** in the *IAQ Reference Guide* for more information.

Stack Effect – The flow of air that results from warm air rising, creating a positive pressure area at the top of a building and a negative pressure area at the bottom of a building. In some cases the stack effect may overpower the mechanical system and disrupt ventilation and circulation in a building.

Unit Ventilator – A single fan-coil unit designed to satisfy tempering and ventilation requirements for individual rooms.

Ventilation Air – The total air, which is a combination of the air brought inside from outdoors and the air that is being recirculated within the building. Sometimes, however, used in reference only to the air brought into the system from the outdoors, which this document defines as “outdoor air ventilation.”

